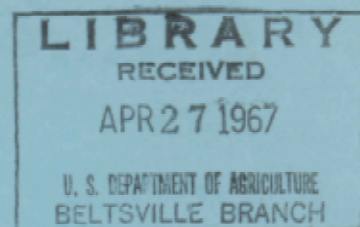


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AGRICULTURAL ECONOMIC REPORT NO. 108



AN ECONOMIC SURVEY OF THE NORTHERN LAKE STATES REGION

ECONOMIC RESEARCH SERVICE • U.S. DEPARTMENT OF AGRICULTURE
IN COOPERATION WITH
MICHIGAN AGRICULTURAL EXPERIMENT STATION • MICHIGAN STATE UNIVERSITY

PREFACE

This report was prepared to aid public and private groups and individuals interested in stimulating economic growth in the Lake States -- Michigan, Minnesota, and Wisconsin. Special emphasis is given to the Northern Region of these States. Fundamental information and analyses are provided to establish priorities among alternative means of increasing the level of economic activity and the incomes of families and individuals.

The study described here is an overall survey of the Northern Lake States, with emphasis on regional analysis. A statistical appendix, presenting county data summarized by States within the Northern and Southern Regions of the Lake States, is included.

This work was completed through a cooperative agreement between the Michigan Agricultural Experiment Station and the Economic Development Division, Economic Research Service, U.S. Department of Agriculture.

A number of individuals, only a few of whom can be acknowledged here, made contributions to the study. Lawrence H. Bishop of the Michigan State University Geography Department did much of the background work on the Geography and Minerals of the Region. John L. Okay, Agricultural Economics Department, prepared the materials for the Recreation and the Forestry and Fisheries sections. W. Smith Greig of the Michigan State University Agricultural Economics Department worked closely with the authors in the early planning phase of the study.

February 1967

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SUMMARY

Population estimates in 1964 indicated that 1.5 million people lived in 79 northern counties of Michigan, Wisconsin, and Minnesota -- an increase of less than 5 percent from 1950. By contrast, over the same period the population in 162 southern counties of those States increased 28 percent, to nearly 15 million persons. (In this report, the two groups of counties are called the Northern Region and the Southern Region.) Between 1950 and 1960, the Northern Region experienced a net outmigration of 10 percent, compared with a net immigration of 1 percent in the Southern Region. There was a net outmigration of 61 percent of the 20- to 24-year age group from the Northern Region during this period. Seventy percent of the persons living in the Southern Region were urban residents, compared with only 40 percent for the Northern Region. The level of educational attainment of persons 25 years and older was slightly lower in the Northern Region than in the Southern Region. However, school enrollment data indicate that this gap is narrowing.

The total labor force in the Northern Region was about 500,000 in both 1950 and 1960. For the same period, the Southern Region labor force increased from 4.6 to 5.3 million; up 14 percent. There was a decline of nearly 11,000 jobs in the Northern Region between 1950 and 1960, while employment in the United States increased over 14 percent. This rate of increase for the Northern Region would have meant 71,000 new jobs.

The proportion of families in the Northern Region with poverty level incomes decreased from 37 to 27 percent from 1949 to 1959. This compares with a change from 29 to 21 percent for the United States. Rural farm families in the Northern Region were the lowest income group, with 44 percent having incomes under \$3,000 in 1959.

Community facilities in the Northern Region are generally comparable with those in the Southern Region. But most public services are more costly on a per capita basis in the Northern Region because of the lower population density.

The economic impact of the St. Lawrence Seaway on the Northern Region is only beginning to be realized. Shipments have increased dramatically. The Seaway has not yet had the anticipated impact on the general economy of the Great Lakes hinterland, but it is too early to tell what the longer run effects will be.

Over 90,000 people in the Northern Region were employed in manufacturing in 1960, an increase of 3,700 jobs from 1950. But there would have been nearly 14,000 more jobs, had the Northern Region increased manufacturing employment at the same rate as the United States. Between 1950 and 1960, the food and kindred products manufacturing industry accounted for the largest gain in number of jobs added. Gains in the machinery and transportation equipment manufacturing industries were almost as large.

Value added in manufacturing in the Northern Region increased 41 percent from 1958 to 1963. This indicates that manufacturing as an economic activity has grown more than the slight gains in employment would suggest.

The minerals industry of the Northern Region is primarily extractive; most processing of raw materials is done outside the region. Both the number of mining establishments and number of employees have decreased in recent years. Value of mineral production has declined slightly since 1960.

Iron ore is the most important mineral of the Northern Region. Recent technological developments in mining have made the use of large deposits of low-grade taconite iron ore economically feasible. While this has brightened the outlook for iron ore interests, increased competition from Canadian and other foreign sources via St. Lawrence Seaway shipping has clouded the picture. The future of the Northern Region iron ore industry will depend on its ability to maintain its competitiveness. The outlook for copper, the second most important mineral in the Northern Region, is good. Production is expected to continue the slight upward trend begun in the 1960's. But because of laborsaving technology, employment has shown a decline in recent years.

Outdoor recreation offers a way to use natural resources that have few alternative uses. Increasing population, rising incomes, and more leisure have greatly stimulated the demand for recreation facilities and related services in the Northern Region. From all indications, the tourist industry will continue to expand. But to remain competitive, tourist facilities and related services will have to be continually upgraded. While the industry as a whole should grow and prosper, only the more competitive will share in this growth.

Agriculture in the Northern Region will undoubtedly follow national trends. Farming will be more specialized and concentrated in the more favorable locations, and there will be fewer but larger and more efficient units.

New forest growth in the Northern Region has created a forested area of high potential and gradually increasing productivity. Since the long-term demand for major timber products is good, these resources could serve as the basis for new economic development. However, employment in the wood-based industries in the Northern Region has declined slightly. Gains in the paper and allied products industries have been largely offset by decreasing employment in lumber and wood products industries.

The Great Lakes commercial fishing industry in recent years has suffered from the disappearance of the valuable lake trout. The annual catch of low-valued species has increased, but not enough to offset the loss of value in lake trout catch. But with the progress being made in the introduction of new species, such as the coho salmon and steelhead, and control of the lamprey and low-value alewife, there is good reason for optimism.

AN ECONOMIC SURVEY OF THE NORTHERN LAKE STATES REGION

By R. A. Loomis and M. E. Wirth 1/

INTRODUCTION

The patterns of economic activity associated with a geographic area depend to a substantial extent on (1) the physical resource base, (2) the social and cultural heritage of the population, and (3) the relationship of the particular area to surrounding areas and the Nation. There is considerable variation in the level of economic activity among geographic areas of the United States.

The idea that the general public should assist areas of low economic activity has gained support during the past few decades. One of the earlier large-scale efforts of this nature was the Tennessee Valley Authority. Later the joint Federal-State Commission was created to concentrate on the economic problems of the Appalachian Region. The Rural Area Development Program of the U.S. Department of Agriculture, while having slightly different guidelines, has been functioning for a number of years. Most recently, in the Public Works and Economic Development Act of 1965, Congress authorized the formation of economic development regions (94). 2/ These are regions that have lagged behind the Nation in economic development, and are eligible for various forms of public assistance.

The northern counties of Michigan, Wisconsin, and Minnesota have an economic history in common with many other areas of a growing and dynamic economy. In the booming economy of westward movement and settlement, the easily accessible and abundant white pine timber provided a prosperous economic base for the "Northland." Following this, the rich iron ore and copper mines of the Superior range provided a primary resource for the growing industrial centers of the Midwest. But as the forests were harvested and the richer ore bodies were mined, and efficiency of exploiting them reduced labor needs, economic decline set in. Agriculture, handicapped by limited areas of productive soil, a short growing season, and remoteness from markets, could not sustain the level of economic activity that had characterized the booming lumber and minerals industries.

1/ Respectively, Agricultural Economist, Economic Development Division, Economic Research Service, U.S. Department of Agriculture, stationed in the Agricultural Economics Department, Michigan State University; and Associate Professor, Agricultural Economics Department, Washington State University, formerly with the Farm Production Economics Division, Economic Research Service, U.S. Department of Agriculture, at Michigan State University.

2/ Underscored numbers in parentheses refer to items in the Bibliography, p. 115.

This brief historical sketch brings us to about the third decade of the 20th century. Since then, the upper counties of the Northern Lake States have been the object of considerable concern. The focus of this concern is the question, "How can the economic opportunity, and thus the welfare, of individuals in the region be improved?"

The economic well-being of this area depends fundamentally on its export industries (58). The people there must produce an exportable surplus to earn income to purchase goods and services from other areas. The basic question is, "In what kinds of production is the region best able to compete with other regions?" (17).

Purpose of the Study

In a broad sense, the purpose of this study is to aid in making the best possible choices among alternative courses of action designed to improve the social and economic well-being of the Northern Lake States Region. Specific objectives of the study are:

- (1) To bring together a broad array of social and economic data on the region.
- (2) To identify problems and point the direction for action programs with the greatest potential for stimulating economic activity in the region.
- (3) To provide a source of basic data for county development organizations.
- (4) To provide a springboard for depth studies of specific problems and potentials of the region.

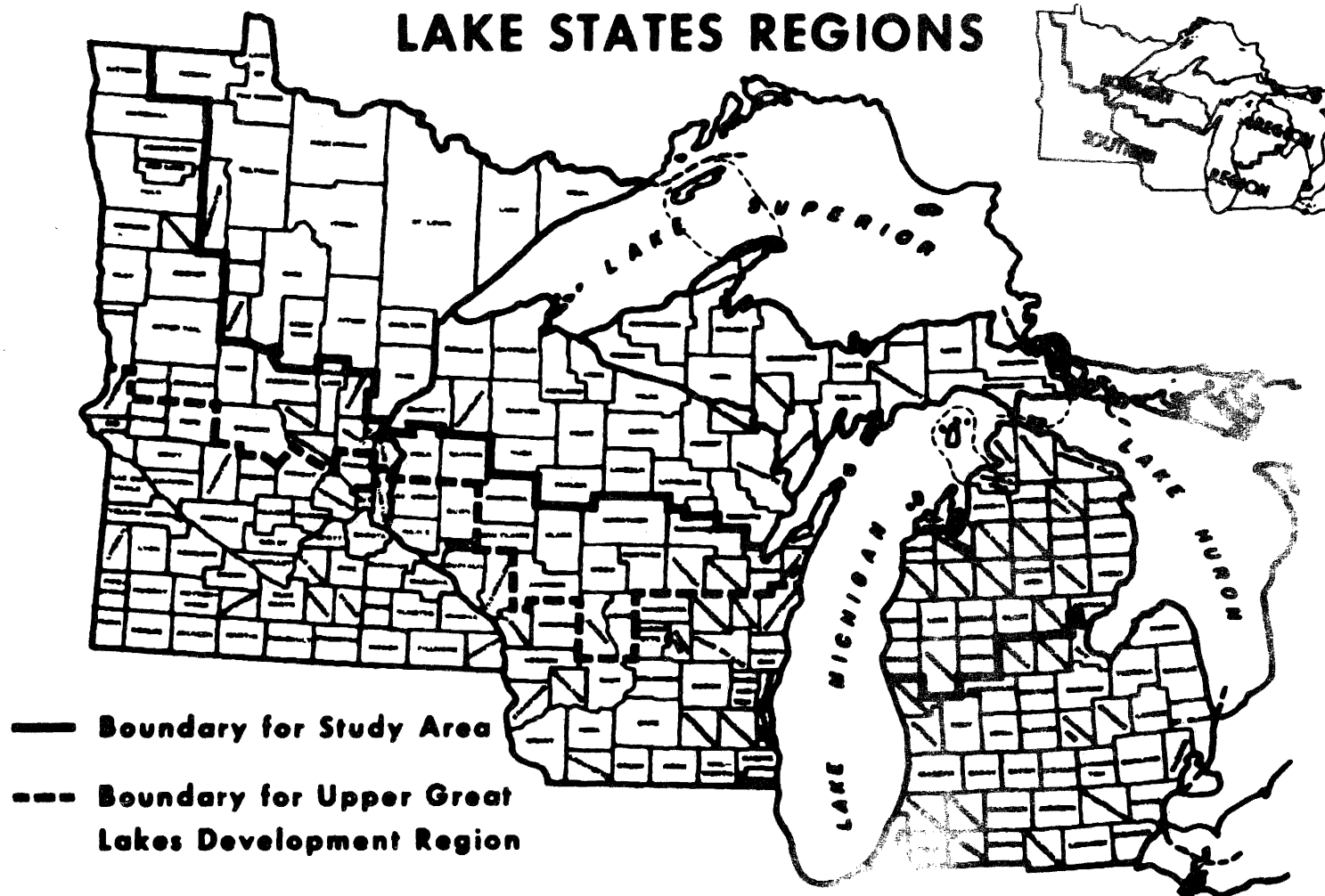
The Region

Delineation of the Northern Lake States Region in this study is based on traditional designations that utilize county line boundaries across the three States of Michigan, Wisconsin, and Minnesota.

The Northern Lake States Region (NR), as referred to in this study, includes the 45 northern counties of Michigan, the 18 northern counties of Wisconsin, and the 16 northern counties of Minnesota -- a total of 79 counties (fig. 1). ^{3/} Data are also presented for the 162 counties of the southern portions of the three States. This area, referred to as the Southern Lake States Region (SR), is included primarily to provide perspective, but also because of the integrated nature of the economies of the northern and southern counties.

^{3/} Menominee County, Wis., was created on May 1, 1961. The area was formerly part of Shawano and Oconto Counties, 7 and 3 townships, respectively. Prior to 1961, statistics for Shawano and Oconto Counties include these townships. In the instances where data used in this study were available for Menominee County, they were included with the Northern Region. However, because such instances are infrequent we have retained the count of 18 counties for Northern Wisconsin.

COUNTIES OF THE NORTHERN AND SOUTHERN LAKE STATES REGIONS



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Figure 1

The smallest geographic unit for data reference in this report is the county. In cases where pertinent data were not available by county, they are presented at the State or tri-State level. When this is done, the 241 counties comprising all the area of the three States are referred to as the Lake States (LS).

The data used throughout this study represent the most up-to-date information available. Wherever relevant and when possible, a time dimension is used in the analyses.

GEOGRAPHY 4/

A major determinant of economic activity in a region is the physical environment. Certainly the history and future of the Northern Region (NR) reflect influences such as geology, topography, soils, and climate.

Water

Water is the dominant physical resource associated with the region. With the exception of the U.S.-Canadian border of northern Minnesota, the region is surrounded by Lakes Superior, Michigan, and Huron. Smaller lakes abound in the region, especially in Wisconsin and Minnesota.

Geology

The basic geology of the region is simple, but local variations are extremely complex. The primary bedrock foundations are of Precambrian and Paleozoic eras, overlain to varying depths by Pleistocene glacial debris of silt, sand, clay, gravel, and boulders.

The Precambrian rock formations are the southern prong of the Canadian Shield, a vast region of ancient rock. These are complex crystalline igneous and metamorphic rocks that form the basis of the rich iron ore and native copper deposits of the Lake Superior minefields.

The Paleozoic sedimentary bedrock areas are farther south in the region, primarily in Michigan, with a small area in eastern Wisconsin. These deposits contain nonmetallic minerals, such as limestone, gypsum, petroleum, and salines.

The Pleistocene glacial deposits covering most of the region show great variation in mineral content. These variations have affected types of soils formed from the deposits. The deposits are also economically important as a source of ground water, sand, and gravel.

4/ The background information for this section was prepared by Lawrence H. Bishop, Geography Department, Michigan State University.

Topography

The topography of the NR is varied. But the total relief is small due to the scouring action of past glaciers. Because of unequal deposits of glacial debris, the region is characterized by rolling terrain with low, rounded hills and level-to-undulating plains. Smaller areas of more rugged and steep topography are found along the shores of Lake Superior, in eastern Minnesota, northern Wisconsin, and the Upper Peninsula of Michigan. Total relief in the region is only about 1,600 feet, with local variations rarely exceeding 200 to 300 feet. Lowlands are located along the shores of the Great Lakes and in the eastern portion of the Michigan Upper Peninsula.

Drainage

Surface water of the region drains into three major systems -- the Mississippi River, the St. Lawrence River, and Hudson Bay. Surface drainage is poor in some areas because of the effects of glaciation and lack of relief. There are many rivers and streams in the region, although many are short with small watersheds. Slow drainage and runoff accumulation in depressed areas are disadvantages from some viewpoints. However, these features also contribute to the creation of lakes and swampy areas for recreation and wildlife, slow-moving streams for canoe enthusiasts, retardation of streambed erosion, and in some instances prevention of lowland flooding.

Soils

The more productive soils are widely scattered in small areas within the NR. Extensive areas of organic soils are in the lowland areas of Michigan and Minnesota.

Almost all the soils of the region have management problems (see section on Agriculture). Some are difficult to till due to structure. Inadequate drainage and drought problems are common. Generally, soils of the region require fertilization, liming, and soil management and conservation practices. However, there are scattered areas with fertile soils and favorable topography and climate.

Climate

The NR has a continental climate with wide variations in temperatures, cold winters, and cool, mild summers. The area is subject to occasional extremes of cold, northern air masses and warmer air masses from the south. The climate is also influenced by the northern location, variations in elevation, and the presence of the Great Lakes. The lakes modify the climate, particularly in Michigan.

In the higher elevations of the northern counties temperatures of 30 to 40 degrees below zero are common. Summer temperatures occasionally reach the 80's and low 90's. Frost-free periods vary from 60 to 160 days per year, with the longest growing season along the western shore of lower Michigan.

Rainfall averages about 20 to 36 inches per year; one-half to two-thirds of it occurs during the growing season. Precipitation is generally adequate for most types of crops grown in the NR. But drought or excessive moisture conditions do occur, usually in limited areas and for short periods.

The average snowfall varies from 30 to 40 inches per year in the lowlands and southern portions of the region, with 160 or more inches in other areas. Snowfall may occur from October through May in the extreme areas. Snow may be on the ground for 100 to 150 days per year in parts of the region. There is considerable variability in the snowfall from year to year, which is important for snow-oriented recreation enterprises.

Climate affects the economic activities of the region in many ways. The cool summers appeal to tourists. The long, cold winters suit skiers, skaters, and ice-fishing buffs. On the other hand, many economic activities have short work seasons because of the climate, and the short growing season handicaps agricultural production. Low winter temperatures freeze the Great Lakes and shorten the shipping season. A short shipping season, coupled with reduced lake-channel depths due to drought, causes economic losses to the iron ore industry. Cold winters mean higher costs for building construction and for road construction and maintenance. In general, while the climatic conditions of the region have some advantages, they substantially limit economic exploitation of natural resources.

The geographic characteristics of the NR are only part of the major environmental influences on the social and economic well-being of the inhabitants. However, they are basic facts that must be considered in developmental planning for the region. The impact of these and other forces is illustrated in a comparison of the economic status of the NR with other areas of the United States in 1960 (fig. 2). Only a few of the counties in the region were among the lowest fifth in economic status as measured here, but only a few were among the highest two-fifths.

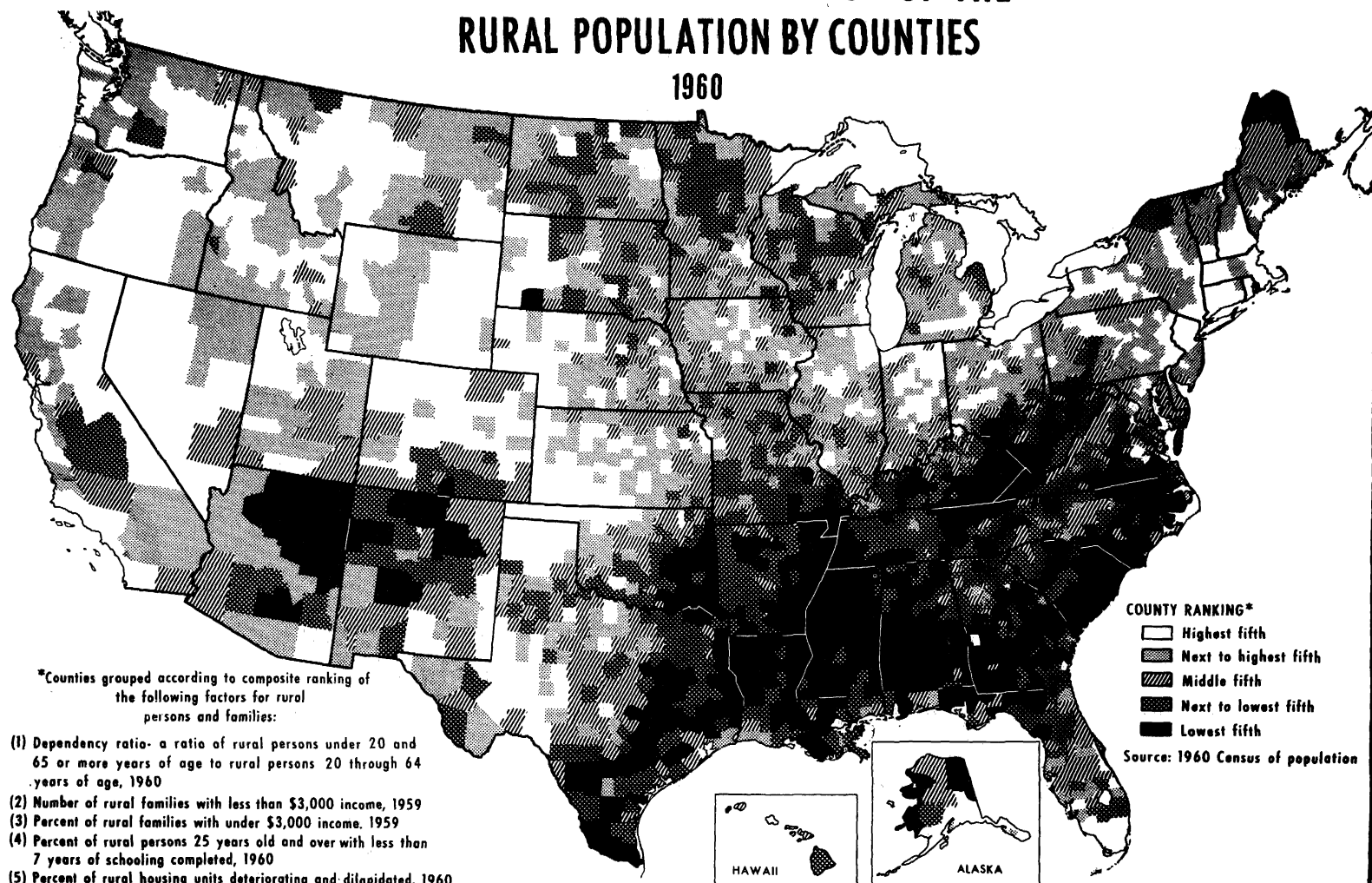
Land Use

Nearly one-half of the total land area of the Lake States is forest and woodland, compared with a third of the U.S. land area (table 1). ^{5/} Grassland, pasture, and range account for about 10 percent of the land use in the Lake States, but over a third of the U.S. land area. Over a third of the land area in the Lake States is used for cropland, while only one-fourth of U.S. land is devoted to this use.

^{5/} Reference to the United States includes only the 48 contiguous States.

RELATIVE ECONOMIC STATUS OF THE RURAL POPULATION BY COUNTIES

1960



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Figure 2

Table 1.--Major uses of land, Lake States and United States, 1950 and 1959

Major land use	Michigan		Wisconsin		Minnesota		Lake States: total		United States	
	1950	1959	1950	1959	1950	1959	1950	1959	1950	1959
	Percent									
Cropland -----	25	29	31	36	41	45	33	37	21	24
Grassland, pasture, and range -----	8	5	13	9	8	6	10	7	37	33
Forest and woodland	51	54	48	44	37	38	44	45	32	34
Special uses -----	9	9	6	8	8	8	8	8	6	6
Miscellaneous and other land -----	7	3	2	3	6	3	5	3	4	3
Total -----	100	100	100	100	100	100	100	100	100	100
	1,000 acres									
Area -----	36,492		35,011		51,206		122,709		1,901,756	

Source: U.S. Department of Agriculture (66, 67).

DEMOGRAPHIC DIMENSIONS

Population Change

Between 1950 and 1960 the U.S. population increased by over 25 million people, or nearly 20 percent (table 2). During the same period the population of the NR increased 3 percent, compared with a 21-percent increase in the SR.

This difference in rate of population change has persisted. It is estimated that between 1960 and 1964 population increased about 2 percent in the NR, 6 percent in the SR, and 7 percent in the United States. The northern counties of Michigan and Minnesota had slight gains in population between 1960 and 1964, but northern Wisconsin declined in population. The slow or negative growth rates in total population indicate that opportunities for gainful employment are limited.

Consistent with the aggregate change in population for the NR, many of the counties declined in population between 1950 and 1960 (fig. 3). With one exception, all the counties that gained in population by 30 percent or more were in the Southern Region. Also, counties with larger cities had the greatest increase in population growth, while in the rural counties population increased only slightly or declined.

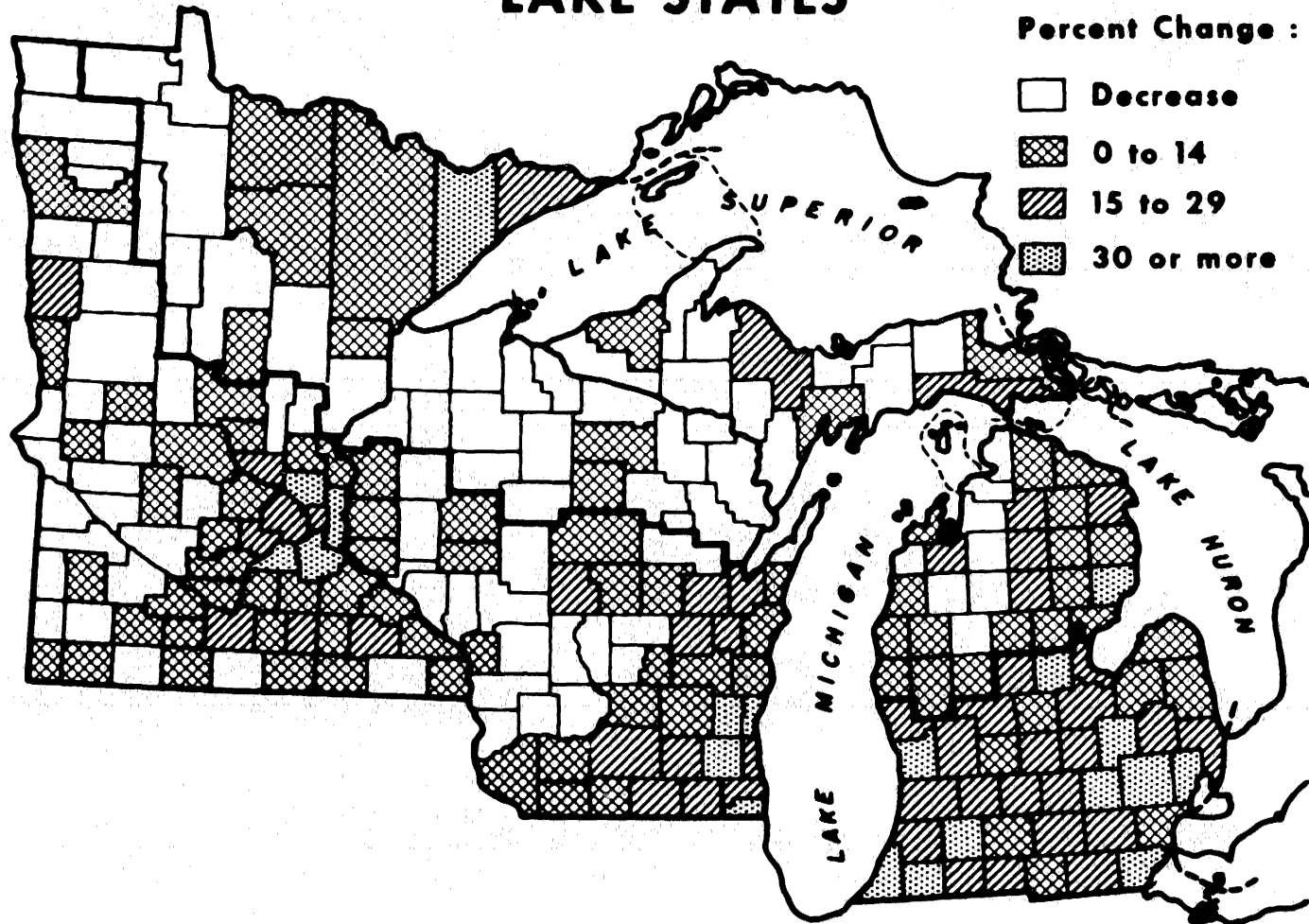
Table 2.--Total population and population change, Northern and Southern Regions of the Lake States, and United States, 1940, 1950, 1960, and 1964 estimates

Year	Northern Region				Southern Region				United States
	Mich.	Wis.	Minn.	Total	Mich.	Wis.	Minn.	Total	
Population in:	<u>Thousands</u>								
1940 -----	657	339	463	1,459	4,599	2,798	2,329	9,726	131,669
1950 -----	661	322	453	1,436	5,711	3,113	2,530	11,354	150,697
1960 -----	696	303	482	1,481	7,129	3,650	2,932	13,711	178,464
1964 estimate <u>1/</u> ----	718	297	492	1,507	7,542	3,919	3,109	14,570	191,765
Percentage change in population from:	<u>Percent</u>								
1940 to 1950 -----	1	-5	-2	-2	24	11	9	17	14
1950 to 1960 -----	5	-6	6	3	25	17	16	21	18
1960 to 1964 -----	3	-2	2	2	6	7	6	6	7

1/ Sales Management Magazine (7).

Source: U.S. Census of Population (79).

CHANGE IN POPULATION, 1950 TO 1960, LAKE STATES



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Figure 3

Residence

A greater proportion of the population in the Southern Region lives in urban centers as compared with the Northern Region. Moreover, the rate of urbanization in recent years has been higher in the SR than in the NR. In 1950 67 percent of the population in the SR were classified as urban residents (those living in towns of 2,500 or more) compared with 39 percent in the NR (table 3). 6/ By 1960, 71 percent of the SR population were urban, compared with only 40 percent in the NR.

In 1960, farm populations in the Northern and Southern Regions were 15 and 10 percent, respectively, of the total population. In 1950, farm residents were 27 percent of the NR population and 15 percent of the SR population (table 3). While the rural nonfarm proportion increased in both regions, the increase was substantially greater in the Northern Region.

Population Density

Nearly one-half (43 percent) of the land area of the Lake States is in the NR, but in 1960 only 10 percent of the population lived in the Northern Region. With few exceptions, population density of the NR is under 30 persons per square mile (fig. 4). Also, the population is more evenly distributed among the counties in the Northern Region than in the Southern Region. Three-fourths of the SR population live in one-fifth of the counties, but less than half of the NR population live in one-fifth of the counties.

A greater proportion of the people in the Southern Region are urban residents. But if the 1960 population is classified in two groups -- those living in towns or cities regardless of size, and those living in the country -- 79 percent of the nearly 14 million people of the Southern Region lived in towns or cities (table 4). Only 53 percent of the nearly 1.5 million people in the Northern Region lived in towns or cities. This relationship between town and country dwellers changed very little in the NR between 1940 and 1960, but in the SR there was more rapid urbanization.

The total number of towns in the NR remained fairly stable from 1940 to 1960, but increased in the SR (table 5). In both 1940 and 1960 the Northern Region had only 2 cities with populations of 25,000 or more, whereas the Southern Region had 35 cities of this size in 1940 and 65 in 1960. The rate of increase in number of smaller towns was substantially greater in the Southern Region. In 1940 the SR had 1,369 towns of less than 25,000 population, and 1,553 towns in 1960. In the NR the increase was only from 331 to 355 towns.

Urbanization causes two types of adjustment problems for communities. The rapidly expanding urban areas primarily experience problems of providing adequate water, power, health, education, welfare, and other public facilities and

6/ Classification of population according to place of residence is in accordance with the U.S. Census of Population, 1950 and 1960. Urban population comprises all persons living in places of 2,500 inhabitants or more; rural farm population comprises all rural residents living on farms; and rural nonfarm comprises the remaining population.

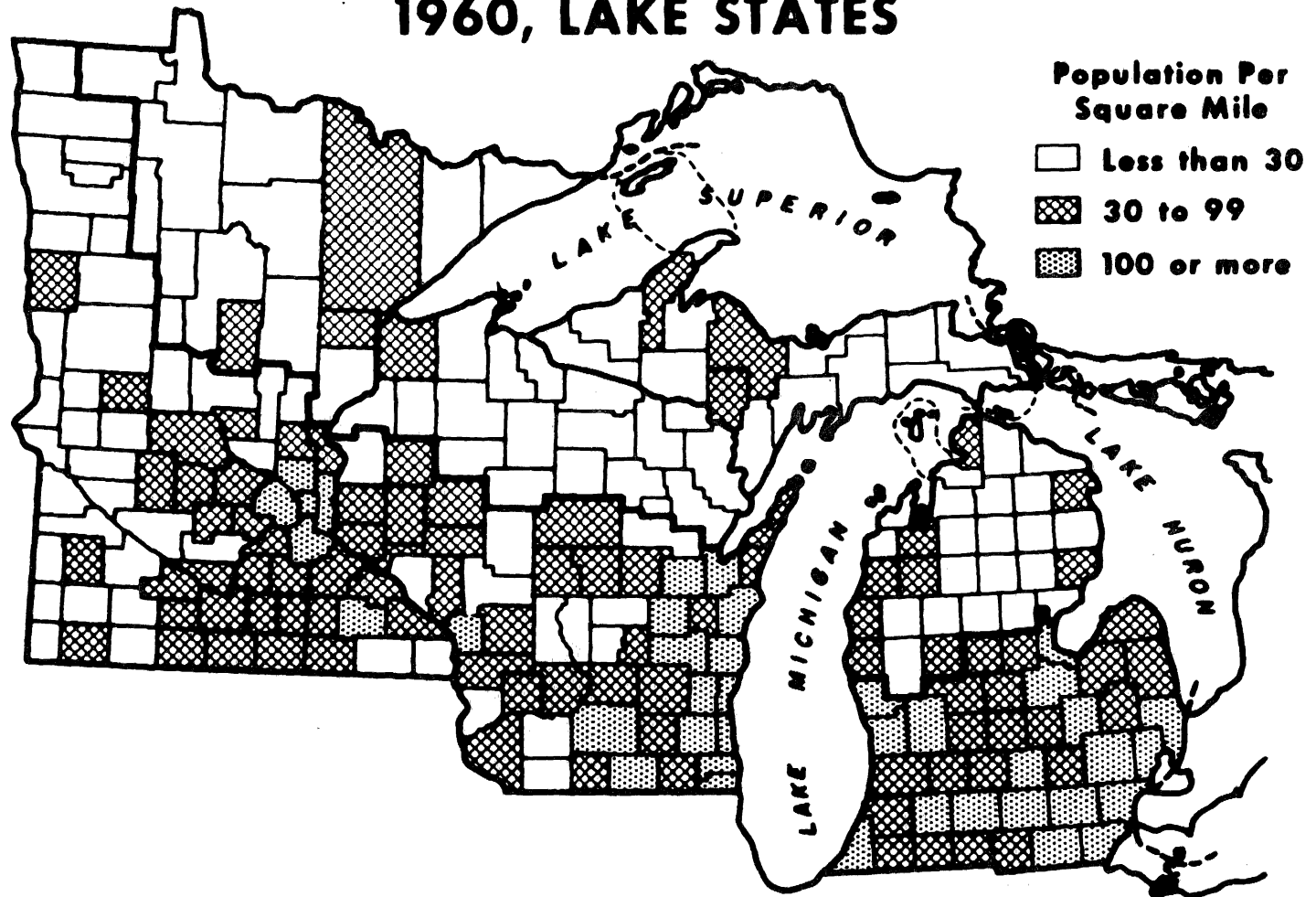
Table 3.--Percentage of population classified as urban, rural nonfarm, and farm, Northern and Southern Regions of the Lake States, and United States, 1950 and 1960

Region and year	Urban	Rural		Total
		Nonfarm	Farm	
<hr/>				
	<hr/> <u>Percent</u> <hr/>			
Northern Region:				
Michigan:				
1950 -----	36	39	25	100
1960 -----	36	52	12	100
Wisconsin:				
1950 -----	35	33	32	100
1960 -----	36	42	22	100
Minnesota:				
1950 -----	47	28	25	100
1960 -----	49	38	13	100
Total:				
1950 -----	39	34	27	100
1960 -----	40	45	15	100
Southern Region:				
Michigan:				
1950 -----	75	16	9	100
1960 -----	77	18	5	100
Wisconsin:				
1950 -----	60	20	20	100
1960 -----	66	21	13	100
Minnesota:				
1950 -----	56	19	25	100
1960 -----	64	18	18	100
Total:				
1950 -----	67	18	15	100
1960 -----	71	19	10	100
United States <u>1</u> /:				
1950 -----	64	21	15	100
1960 -----	70	23	7	100

^{1/} Forty-eight contiguous States.

Source: U.S. Census of Population, 1950 and 1960 (79).

POPULATION PER SQUARE MILE, 1960, LAKE STATES



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Figure 4

Table 4.-- Percentage distribution of population, by size of towns and rural areas, Northern and Southern Lake States Regions, 1940, 1950, and 1960

Population	Northern Region			Southern Region		
	1940	1950	1960	1940	1950	1960
	<u>Percent</u>					
Population living in towns of:						
Less than 2,500 -----	12	13	13	9	8	7
2,500 to 4,999 -----	16	9	10	2	7	10
5,000 to 9,999 -----	10	10	11	4	4	5
10,000 and greater ---	12	20	19	55	55	57
Population not living in towns -----	50	48	47	30	26	21
Total population:						
Percent -----	100	100	100	100	100	100
Number (thousands) ---	1,460	1,436	1,481	9,726	11,353	13,710

Source: U.S. Census of Population, 1940, 1950, and 1960 (79).

Table 5.--Land area and number of towns by population, Northern and Southern Lake States Regions, 1940, 1950, and 1960

Population of towns	Northern Region (area 81,908 square miles)			Southern Region (area 109,828 square miles)		
	1940	1950	1960	1940	1950	1960
	<u>Towns</u>					
Less than 2,500 -----	273	286	289	1,181	1,208	1,227
2,500 to 4,999 -----	29	25	36	84	102	154
5,000 to 9,999 -----	18	21	21	63	72	99
10,000 to 24,999 -----	11	10	9	41	53	73
25,000 to 49,999 -----	1	1	1	21	23	38
50,000 to 99,999 -----	--	--	--	8	11	18
100,000 and greater ----	1	1	1	6	6	9
Total -----	333	344	357	1,404	1,475	1,618

Source: U.S. Census of Population, 1960 (79).

services. Problems associated with the waning economy of the small towns are increased per capita costs for public services and facilities, decreased number and quality of services and facilities, or both increased costs and decreased services.

Age of the Population

The age distribution of the population in the SR was similar to that of the United States in both 1950 and 1960 (table 6). However, in the NR a somewhat greater proportion of the population was 14 years and under or 55 years and older. Between 1950 and 1960 the proportion 14 years and under increased in both regions of the Lake States, as well as in the United States. But the rural farm population has a greater proportion of younger people than the whole population.

Dependency Ratio

The age distribution between those of the economically productive ages and those who are dependent is the dependency ratio. It is the number of persons

Table 6.--Percentage distribution of total and farm populations, by age classification, Northern and Southern Lake States Regions and United States, 1950 and 1960

Age classification (years)	Total population			Farm population		
	Northern Region	Southern Region	United States	Northern Region	Southern Region	United States
	----- Percent -----					
1950:						
0 to 14 -----:	29	27	27	33	32	33
15 to 39 -----:	33	37	38	31	34	34
40 to 54 -----:	18	19	18	17	17	17
55 and older --:	20	17	17	19	17	16
Total -----:	100	100	100	100	100	100
1960:						
0 to 14 -----:	33	33	31	33	34	34
15 to 39 -----:	29	32	33	27	28	32
40 to 54 -----:	18	17	18	20	20	17
55 and older --:	20	18	18	20	18	17
Total -----:	100	100	100	100	100	100

Source: U.S. Census of Population, 1950 and 1960 (79).

less than 20 years old plus those 65 years and older, divided by the number of persons age 20 to 64.

Between 1950 and 1960 the dependency ratio increased from 0.83 to 1.05 in the Northern Region, from 0.72 to 0.95 in the Southern Region, and from 0.72 to 0.90 in the Nation as a whole (table 7). The dependency ratio in both the Northern and Southern Regions was somewhat greater for the rural farm population than for the total population.

Migration

Population movement indicates adjustment to social and economic change. It is both cause and effect of geographic differentials of population growth, income, living conditions, job opportunities, and individual and group expectations and aspirations.

Net migration is the difference between the number of persons who have moved into a given area and those who have moved out of the area during the same time period. The net migration rate is simply the net migration as a percentage of the total population of the area at the most recent census count.

Table 7.--Dependency ratio for total and farm populations, Northern and Southern Lake States Regions and United States, 1950 and 1960 1/

Regions	Farm population		Total population	
	1950	1960	1950	1960
	<u>Ratio</u>			
Northern Region:				
Michigan -----	1.03	1.11	.84	1.03
Wisconsin -----	.99	1.15	.84	1.09
Minnesota -----	1.01	1.06	.82	1.07
Total -----	1.01	1.11	.83	1.05
Southern Region:				
Michigan -----	.92	1.06	.69	.93
Wisconsin -----	.91	1.09	.57	.96
Minnesota -----	.91	1.08	.77	1.00
Total -----	.91	1.08	.72	.95
United States <u>2/</u> -----	1.00	1.05	.72	.90

1/ Dependency ratio is the number of persons less than 20 years of age plus those 65 years of age and older, divided by the number of persons age 20 to 64.

2/ Forty-eight contiguous States.

Source: U.S. Census of Population, 1950 and 1960 (79).

The 1950 to 1960 net migration patterns of the NR and the SR are strikingly different. The Northern Region experienced a net outmigration of 10 percent, while the Southern Region had a net immigration of 1 percent (table 8). Despite the difference in percentages, the number of migrant persons was approximately 150,000 for each region.

The variation in net migration rates among age groups is even more important. In the Northern Region there was an outmigration rate of 61 percent in the 20- to 24-year age group and 30 percent for those 15 to 34 years of age (table 8). Net outmigration of persons 15 to 34 years old accounted for over 70 percent (105,000) of the total outmigrants. The loss of young people, who are generally better educated and trained than older people, is a depletion of a valuable and productive resource.

The 20- to 24-year-olds who left the NR do not appear to have gone to the SR. A net of approximately 46,400 of this age group left the NR, but the SR also had a net outmigration of this age group of about 9,000 persons. However, in the 25- to 34-year-old group the NR had a net outmigration of about 36,000 persons, compared to the SR immigration of nearly 100,000 persons. Nearly two-thirds of the total net immigration to the SR from 1950 to 1960 consisted of persons 25 to 34 years old. As the net outmigration of the more productive persons is a loss to the NR, it is a gain of a valuable resource for some other regions. ^{1/}

^{1/} See Appendix Table 74 for more detail on net migration by age.

Table 8.--Net migration of civilian and military population, by age, Northern and Southern Lake States Region, 1950-1960

Age group, years	Net migration		Net migration rate ^{1/}	
	Northern Region	Southern Region	Northern Region	Southern Region
	<u>Number</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>
Less than 15 -----:	-15,311	90,714	-3	2
15 to 19 -----:	-22,245	1,548	-19	<u>2/</u>
20 to 24 -----:	-46,410	-8,955	-61	-1
25 to 34 -----:	-36,223	97,939	-23	6
35 to 49 -----:	-12,788	35,207	-5	1
50 and older -----:	-14,254	-63,044	-4	-2
All ages -----:	-147,231	153,409	-10	1

^{1/} Number of persons as a percentage of 1960 population.

^{2/} Less than 0.5 percent.

Source: U.S. Department of Agriculture (68).

With few exceptions, the counties in the Northern Region showed a net out-migration between 1950 and 1960 (fig. 5). The heavy net immigration areas of the Southern Region were the counties including and near the larger urban centers.

Beegle and others (4) described the county migration patterns of the region in relation to the county average farm operator level-of-living index and the proportion of employed persons in manufacturing (fig. 6). They concluded that counties with net outmigration had a low proportion of persons employed in manufacturing, and that counties with net immigration had a high farm operator level-of-living index. However, farm areas remote from large cities experienced net outmigration regardless of the farm operator level-of-living levels, indicating that employment opportunities in manufacturing were the major attraction.

Employment Commuting Patterns

Employment opportunities do not always necessitate outmigration. With improved roads and automobiles it is common to commute substantial distances between place of residence and place of work. Figure 7 combines two commuting phenomena: (1) The proportion of workers employed in a county other than the one in which they live, and (2) the location of the larger urban centers of the Lake States. The counties containing large cities have relatively few people who commute to other counties to work, while counties surrounding urban areas have a high proportion of commuters.

In counties that are remote from large cities, few workers commute across county lines, because there are few employment opportunities within commuting range.

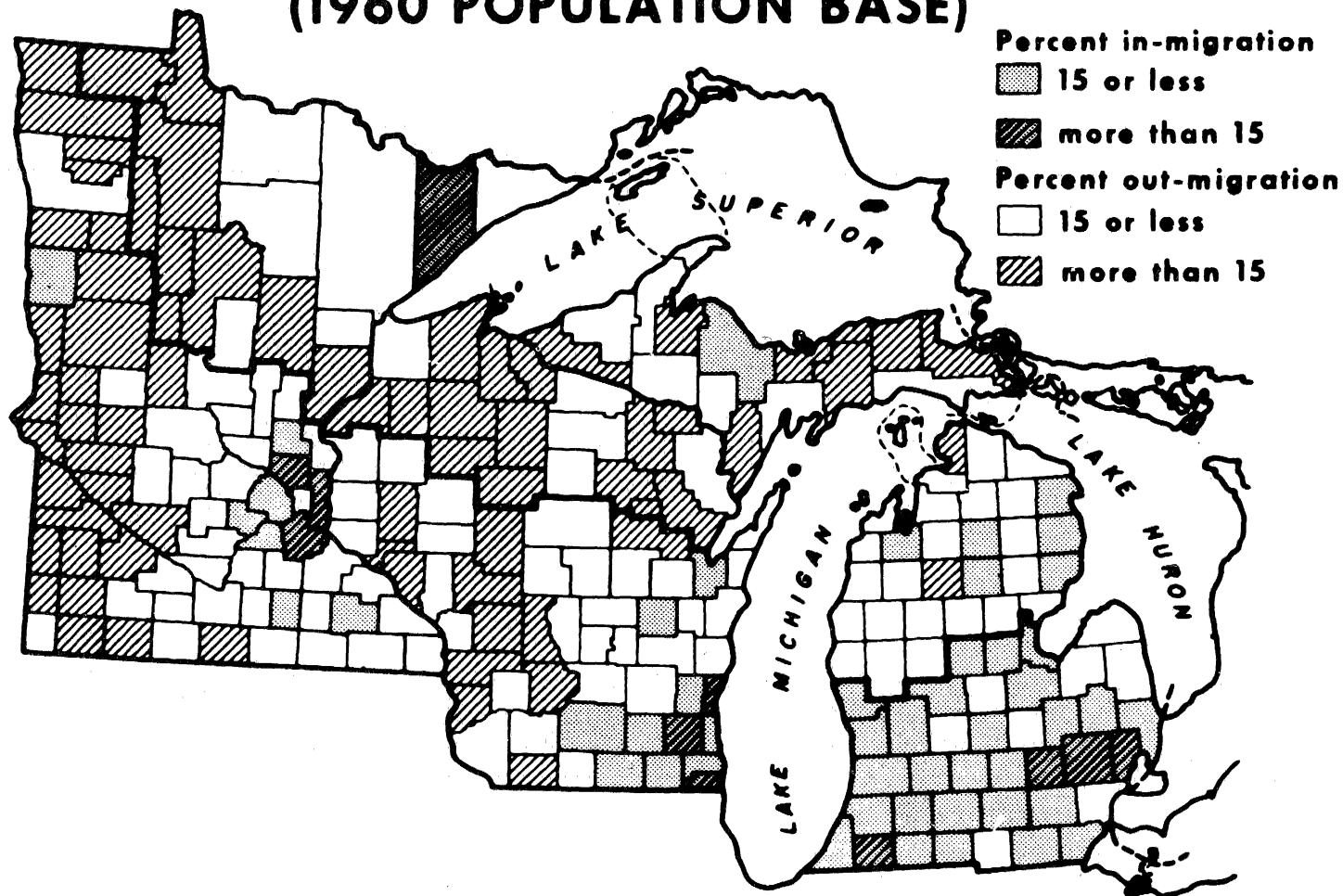
Years of Schooling

In 1960, 44 percent of the population 25 years and older in the NR had completed 8 or fewer years of school (table 9). This percentage was slightly higher than in the SR or the United States as a whole. About the same proportion in each region had from 1 to 4 years of high school. The NR had a slightly smaller proportion with a college education than the SR.

From 1950 to 1960 there was a general upgrading in educational attainment of the population 25 years and older in both the Northern and Southern Regions. However, in the NR there was a larger percentage decrease than in the SR of those having only an elementary education. This implies that a substantial proportion of the NR outmigrants completed only elementary school.

There are slight differences between the Northern and Southern Regions in years of schooling completed for persons 25 years and older. Differences are also slight between the urban, rural nonfarm, and farm population of the two regions (table 10). However, educational attainment of urban, rural nonfarm, and farm people is substantially different within each region. In 1960 only 2 percent of the adult farm population had 4 or more years of college, compared with 4 to 5 percent of the rural nonfarm and 7 to 8 percent of the urban residents. Nearly one-half of the adult population in the urban areas of the Lake

PERCENT NET MIGRATION 1950 TO 1960, LAKE STATES (1960 POPULATION BASE)



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Figure 5

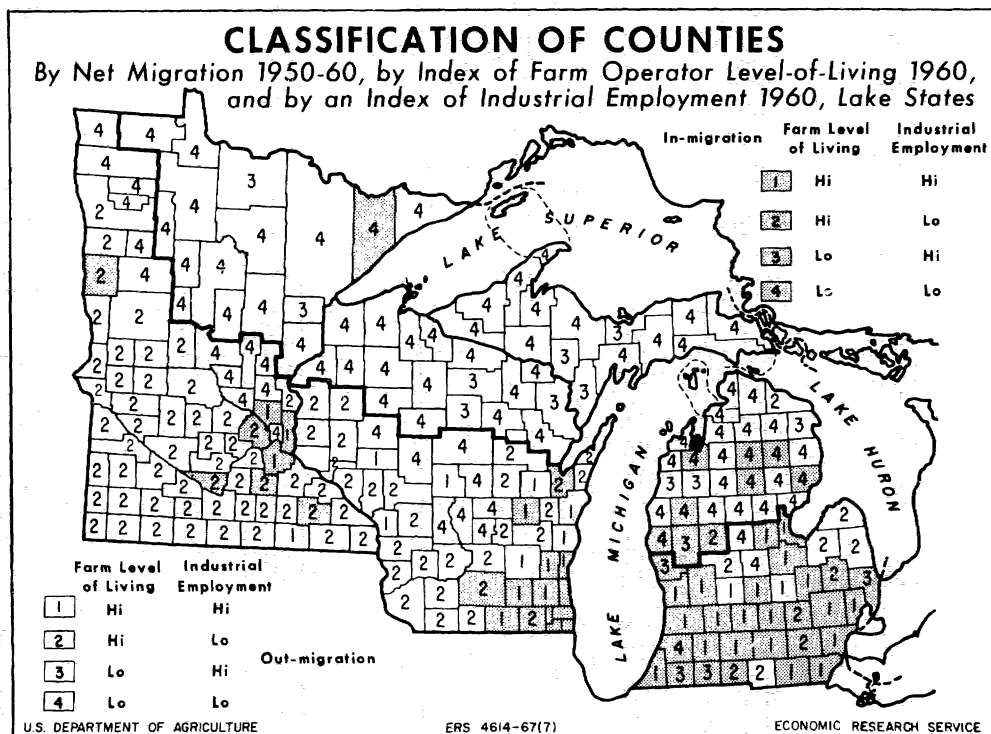


Figure 6

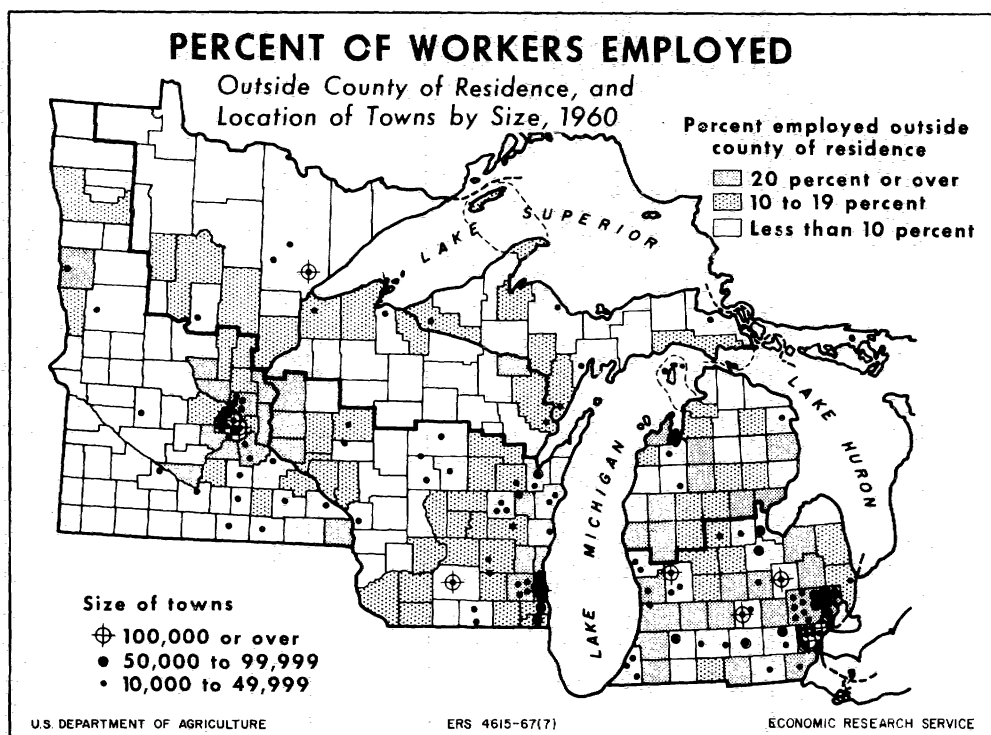


Figure 7

Table 9.--Percentage distribution of total population 25 years and older, by years of school completed, 1960, and percentage change in the distribution, 1950-60, Northern and Southern Lake States Regions and United States

Years of school completed	1960			Change 1950-60		
	Northern Region	Southern Region	United States	Northern Region	Southern Region	United States
	<hr/> Percent <hr/>					
Elementary:						
Less than 7 --:	13	11	16	-30	-12	-10
7 to 8 -----:	31	28	24	-12	-2	<u>1/</u>
High school:						
1 to 3 -----:	18	19	19	16	25	28
4 -----:	25	26	24	37	38	38
College:						
1 to 3 -----:	8	9	9	20	33	39
4 or more ----:	5	7	8	30	44	44
Total -----:	100	100	100	--	--	--

1/ Less than 0.5 percent change.

Source: U.S. Census of Population, 1950 and 1960 (79).

Table 10.--Cumulative percentage distributions of urban, rural nonfarm, and farm populations 25 years and older, by years of school completed, Northern and Southern Lake States Regions, 1960

Years of school completed	Urban population		Rural nonfarm population		Farm population	
	Northern Region	Southern Region	Northern Region	Southern Region	Northern Region	Southern Region
	<hr/> Percent <hr/>					
Elementary:						
Less than 7 --:	100	100	100	100	100	100
7 to 8 -----:	89	90	86	89	84	90
High school:						
1 to 3 -----:	64	66	54	56	43	42
4 -----:	45	46	35	38	28	30
College:						
1 to 3 -----:	17	19	11	13	8	8
4 or more ----:	7	8	4	5	2	2

Source: U.S. Census of Population, 1960 (79).

States had completed 4 years of high school. But less than one-third of farm adults were high school graduates.

Among those 25 years and older in the Lake States, urban residents completed more years of schooling than rural nonfarm residents, who in turn had more schooling than the farm people.

While the general education of the farm population is lower than for the nonfarm population, there was a stronger upgrading in the farm sector from 1950 to 1960 in both the Northern and Southern Regions (table 11). This is indicated by the increased proportion completing high school. The traditional gap in number of years of school completed between the farm and rural nonfarm population is narrowing.

School Enrollment

Data on the education of persons 25 years and older is more indicative of past than present trends. School enrollment indicates the current situation. Census data are not available to compare enrollment of rural farm and nonfarm residents for 1950 and 1960. The most recent school enrollment data by counties are in the 1960 Census of Population.

There was little difference between the Northern and Southern Regions in the proportion of the population enrolled in school, by age group, in 1960 (table 12). However, in the Northern Region a higher percentage of those 5 to 34 years of age were enrolled in high school. It is likely that the heavy out-migration of this age group included a large share of high school dropouts.

Nearly 9 out of 10 students in the NR and 8 out of 10 in the SR were enrolled in public schools (table 13). Southern Wisconsin had the highest proportion of students enrolled in private schools (28 percent) in 1960. This differential between public and private school enrollment is relevant to the interpretation of data on local government expenditures for public education.

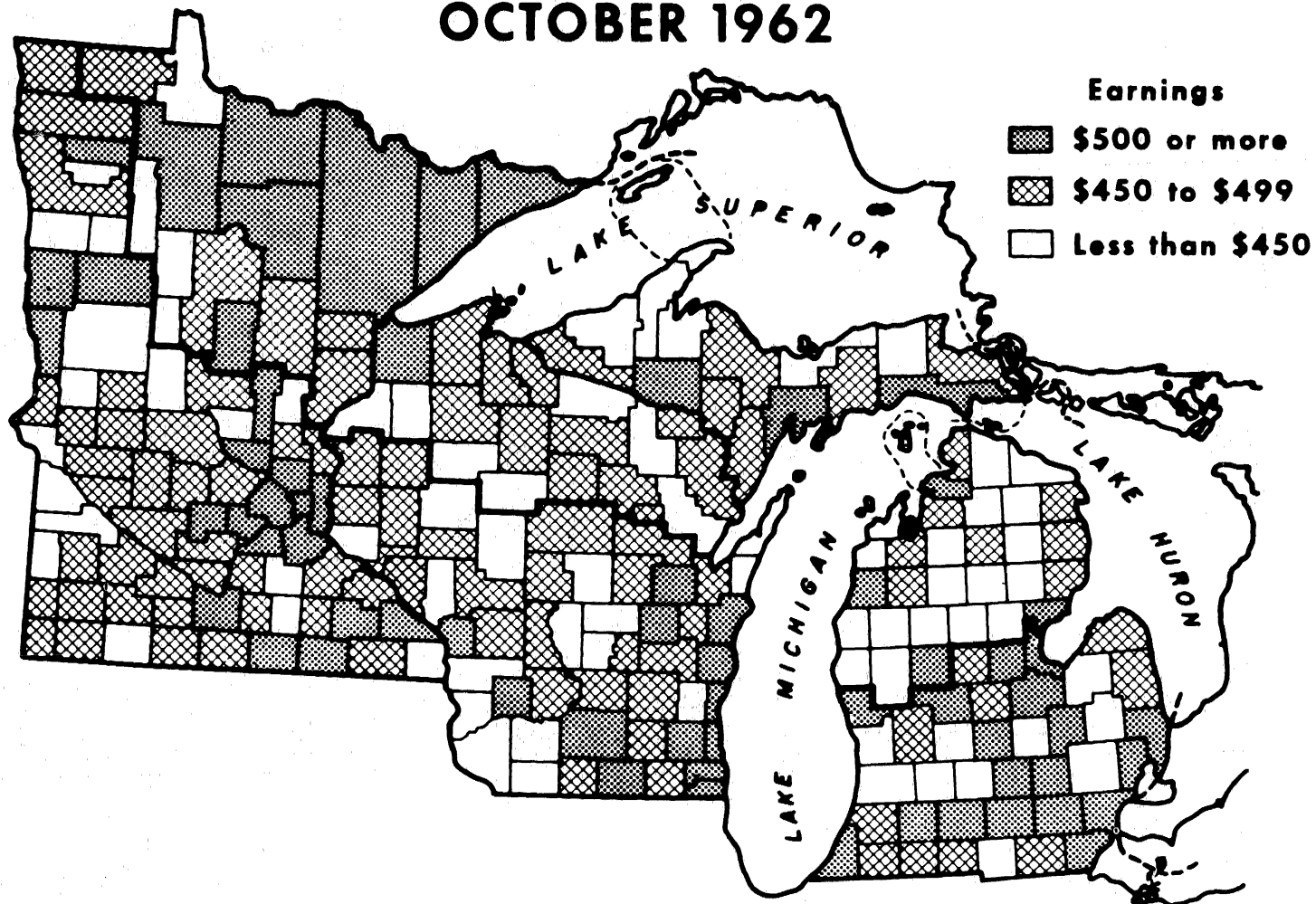
The number of students per public school teacher is the same for the Northern and Southern Regions, with an average of 21 students per teacher.

Public Educational Expenditures

Public expenditure for elementary and secondary schools is expanding. It is the largest segment of State and local government expenditures, accounting for more than one-third of their budgets. Educational expenditures per public school pupil by local governments in 1962 were \$481 in the Northern Region and \$563 in the Southern Region. Average monthly earnings of full-time public school teachers was higher in October 1962 in the SR (\$569) than in the NR (\$483) (table 13). In Northern Minnesota, teachers' salaries averaged about the same as in the SR. The variation in teachers' earnings in the Lake States is illustrated in figure 8.

The most recent data by counties on per capita public expenditures for education are 1962 data. Again Minnesota, particularly Northern Minnesota,

AVERAGE MONTHLY TEACHER EARNINGS, OCTOBER 1962



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Figure 8

Table 11.--Percentage distribution of nonfarm and farm population 25 years and older, by years of school completed, Northern and Southern Lake States Regions, 1950 and 1960

Years of school completed	Nonfarm population ^{1/}				Farm population			
	1950		1960		1950		1960	
	No. :	So. :	No. :	So. :	No. :	So. :	No. :	So. :
	Region:	Region:	Region:	Region:	Region:	Region:	Region:	Region:
Percent								
Elementary:								
Less than 7 :	18	14	13	11	24	15	16	10
7 to 8 -----:	31	30	28	26	47	52	41	48
High school:								
1 to 3 -----:	17	18	19	20	12	12	15	12
4 -----:	21	23	26	26	12	14	20	22
College:								
1 to 3 -----:	8	8	8	9	4	5	6	6
4 or more --:	5	7	6	8	1	2	2	2
Total ---:	100	100	100	100	100	100	100	100

^{1/} Nonfarm population includes urban and rural nonfarm.

Source: U.S. Census of Population, 1950 and 1960 (79).

Table 12.--Percentage of total population in age group 5 to 34 years, and percentage distribution enrolled in school by grade level, Northern and Southern Lake States Regions and United States, 1960

Item	Northern Region	Southern Region	United States
Percent			
Age group:			
5-19 -----:	87	88	94
20-34 -----:	8	8	8
5-34 -----:	60	56	56
Grade level:			
Kindergarten ---:	6	7	5
Elementary (1-8):	63	64	66
High school(1-4):	26	22	22
College -----:	5	7	7
Total -----:	100	100	100

Source: Census of Population, 1960 (79).

Table 13.--Selected educational statistics, Northern and Southern Lake States Regions, 1960 and 1962

Item	Northern Region				Southern Region			
	Mich.	Wis.	Minn.	Total	Mich.	Wis.	Minn.	Total
School enrollment, kindergarten through high school, ages 5 to 34, 1960:								
Students (thousands) --	178	77	122	377	1,754	859	702	3,315
Percent in public schools -----	87	85	94	89	84	72	80	80
Percent in private schools -----	13	15	6	11	16	28	20	20
Number of public school students per full-time equivalent public school teacher, 1962 -----	23	21	20	21	22	19	20	21
Educational expenditures of local governments per public school student, kindergarten through high school, ages 5 to 34, 1962 -----	\$422	\$486	\$559	\$481	\$539	\$592	\$593	\$563
Average earnings of full-time public school teachers, October 1962 ^{1/}	\$435	\$456	\$561	\$483	\$596	\$534	\$546	\$569

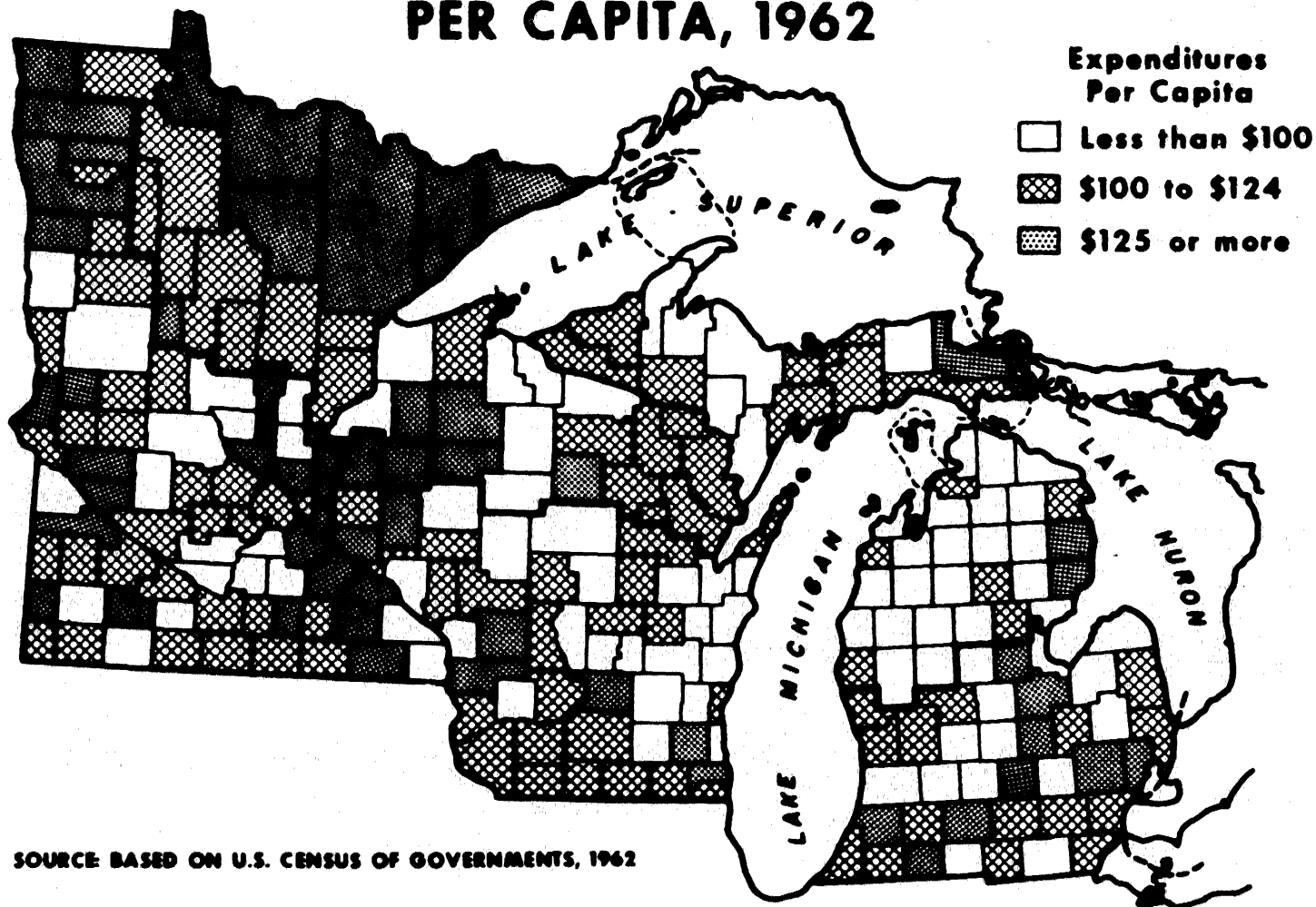
^{1/} "Average earnings of full-time employees," as shown in various tables, represent the result of dividing full-time payroll amounts for October 1962 by the number of full-time employees. In referring to average October earnings for various functions, it should be noted that educational employees are in many instances paid on the basis of a 9- or 10-month school term, rather than uniformly throughout the year as is the prevailing practice for other public employees.

Source: Census of Population, 1960 (79), and Census of Governments, 1962 (76).

ranks high (fig. 9). Variation in per capita public expenditures for education can result from high costs due to low population density or differences in the quality of education offered. But we do not have a basis for analyzing these variations in this study.

In fiscal 1964, Michigan was spending over one-third more per capita than Wisconsin on education (table 14). However, per capita expenditures for higher

PUBLIC EDUCATIONAL EXPENDITURES PER CAPITA, 1962



SOURCE BASED ON U.S. CENSUS OF GOVERNMENTS, 1962

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Figure 9

Table 14.--Per capita expenditures for education, Lake States, fiscal 1964

State	Rank among the 50 States	Per capita State expenditures --	
		For all education	For higher education
		----- Dollars -----	
Michigan -----	11	91	42
Minnesota -----	13	87	35
Wisconsin -----	29	66	37

Source: National Education Association (47).

education were nearly the same in all three States. There is usually a positive relationship between educational expenditures and quality of education.

Institutions of Higher Learning

In 1964, there were 180 accredited institutions in the Lake States offering at least a 2-year program of college level studies in residence (table 15). Twenty-four, or 13 percent, of these were in the NR. But only 6 percent of the students were attending colleges in the NR. There were 17 students per 1,000 population in the NR, compared with 29 in the SR. ^{8/} In the fall of 1964, 29 percent of the students in the Lake States were enrolled in the largest three institutions. There were 33 institutions with fewer than 100 students. Median enrollment per institution was 562 for the Lake States, with a median of 1,046 in Michigan, 674 in Minnesota, and 291 in Wisconsin. There was an increased student enrollment of 58,500 in the Lake States between the fall of 1963 and 1964. Two-thirds of this increase was in Michigan.

LABOR FORCE ^{9/}

The total labor force in the Northern Region was approximately 500,000 in both 1950 and 1960 (table 16). In the Southern Region for this same period, the labor force increased by 14 percent, from 4.6 to 5.3 million. Most of this difference between the two regions is due to the difference in population growth. In the NR between 1950 and 1960, population increased 3 percent, compared with a 21-percent increase in the SR. In both regions the labor force increased at a slightly lower rate than population.

^{8/} These are gross data, without consideration of interregional or interstate enrollment.

^{9/} The labor force includes all persons 14 years and over who were employed or seeking employment during the week prior to the census interview. Unless otherwise noted, the total labor force includes members of the armed forces.

Table 15.--Selected information on institutions of higher learning,
Northern and Southern Lake States Regions, Fall 1964

Item	Michigan	Wisconsin	Minnesota	Lake States total
Number of institutions of higher learning:				
Northern Region -----	9	7	8	24
Southern Region -----	62	56	38	156
Total -----	71	<u>1/63</u>	46	180
Percentage of institutions:				
Northern Region -----	13	11	17	13
Southern Region -----	87	89	83	87
Total -----	100	100	100	100
Student enrollment:				
Northern Region -----	16,738	5,585	2,925	25,248
Southern Region -----	216,787	100,512	109,559	426,858
Total -----	233,525	106,097	112,484	452,106
Percentage of students:				
Northern Region -----	7	5	3	6
Southern Region -----	93	95	97	94
Total -----	100	100	100	100
Median enrollment per institution -----	1,046	291	674	562
Percentage of students in three largest institutions -	40	78	61	29
Number of students per 1,000 population:				
Northern Region -----	23	19	6	17
Southern Region -----	29	26	35	29
Totals (weighted) -----	28	25	31	28

1/ Each of the eight Wisconsin State University campuses is included as a separate institution.

Source: U.S. Department of Health, Education, and Welfare (84, 85).

Table 16.--Total labor force, employment, and unemployment, Northern and Southern Lake States Regions, 1950 and 1960

Item	1950 <u>1/</u>		1960 <u>1/</u>		Change 1950 to 1960	
	No.	So.	No.	So.	No.	So.
	Region	Region	Region	Region	Region	Region
	Persons	Persons	Persons	Persons	Percent	Percent
Total employed (civilian and military) -----	482,479	4,419,930	471,854	4,980,704	-2	13
Total unemployed (experienced and inexperienced):	32,798	192,001	45,062	283,070	37	47
Total labor force (civilian and military)	515,277	4,611,931	516,916	5,263,774	<u>2/</u>	14
	Percent	Percent	Percent	Percent		
Percent unemployed is of total labor force -----	7	4	9	5	3	1
Percent employed is of total population -----	34	39	32	36	-2	-3

1/ In the 1960 census, data on employment refer to the calendar week prior to the date on which the respondents filled the household questionnaire or were interviewed by enumerators. This week is not the same for all respondents because not all persons were enumerated during the same week. The majority of the population was enumerated during the first half of April. Employment status data for the 1950 census refer to the approximately corresponding period in 1950.

2/ Less than 1 percent.

Source: U.S. Census of Population, 1950 and 1960 (79).

Fragmentary data indicate that during the past 15 years, unemployment rates in the NR have been higher than those of the SR. The 1950 and 1960 population censuses support this conclusion, which is also consistent with the net out-migration pattern for the NR. Unemployment in the Northern Region increased from 6 to 9 percent of the labor force between 1950 and 1960. Comparable rates were 4 and 5 percent for the Southern Region. With the increase in unemployment in the NR and the absence of growth of the labor force, fewer people were employed in 1960 than in 1950.

Changes in Number of Jobs

The 1960 census permits useful conclusions on the changing structure of the labor market in the Northern and Southern Regions. Industries and occupations were classified as growing or declining if they showed an increase or decrease, respectively, in number of jobs in 1960 compared with 1950.

Change in number employed, however, is only one measure of comparative advantage. An industry with automation and other technological innovations

may be a declining industry only in number of jobs. The industries in the SR have been subject to more laborsaving innovations than the primary resource producing industries of the NR. Iron ore mining in the NR is an exception.

There was a decline of nearly 27,000 jobs in the NR between 1950 and 1960, while employment in the United States increased by 14.5 percent. Had employment increased in the Northern Region at the same rate as the U.S. rate, 71,000 new jobs would have been created. The NR was nearly 100,000 jobs short of equaling the U.S. rate of growth in employment between 1950 and 1960.

Employment in the Southern Region during the same period increased by nearly 600,000 jobs, but at a slower rate than for the United States. The SR was about 65,000 jobs short of equaling the U.S. rate of change in employment from 1950 to 1960.

The agricultural industry had the largest employment in the Northern Region in 1950 (table 17), but it was only fourth in 1960, with a decline from 106,000 to 51,000 employees. The services industry moved from fourth in 1950 to first in 1960. The mining industry ranked sixth in 1950, but seventh by 1960. Of all the major industries, the forestry and fisheries industries had the smallest employment in both 1950 and 1960. 10/

In the Southern Region there was less change in the rank of industries by employment than in the northern counties. In both 1950 and 1960, manufacturing in the SR ranked first in employment, with nearly twice as many employees as any other industry.

For the United States, there was an increase in the number of jobs between 1950 and 1960 in 7 out of the 10 industry groups (table 18). None of these industries in the NR increased employment quite as rapidly; in the SR only two industries increased employment more rapidly and a third industry equaled the U.S. rate.

The largest decline in the number of jobs in the Northern Region was in agriculture, while the largest gain was in the services industry (figs. 10 and 11). The same pattern prevailed in the Southern Region (Appendix table 75).

The decline in agricultural employment from 1950 to 1960 in the NR exceeded the rate of decline for the United States. But in the SR, employment in agriculture declined more slowly than in the Nation. In 1960, there were 37,400 more people employed in SR agriculture than there would have been had the rate of decline been the same as the U.S. rate (fig. 12). Between 1950 and 1960,

10/ While detailed data are not available, it is well known that a substantial part of the logging work force in the NR is drawn from farmers, miners, construction workers, and other workers who supplement their income in logging during slack periods. Therefore, these data do not reflect the total employment in forestry. By using labor requirements per unit volume of products, Lee M. James (17) estimates that 18 percent of the labor force in Michigan's Upper Peninsula was devoted to wood-based industries in 1960. If this relationship was the same for the entire NR, the forestry industry would rank among the largest in terms of employment.

Table 17.--Ranking of industries by number of persons employed, Northern and Southern Lake States Regions, 1950 and 1960

1950			1960		
Rank :	Industry <u>1/</u>	: Number of: : employees:	Rank :	Industry <u>1/</u>	: Number of : employees
Northern Region					
1	Agriculture	105,732	1	Services <u>3/</u>	94,974
2	Manufacturing	90,121	2	Manufacturing	93,817
3	Wholesale and retail trade <u>2/</u>	82,397	3	Wholesale and retail trade <u>2/</u>	86,300
4	Services <u>3/</u>	78,374	4	Agriculture	50,818
5	Transportation and utilities <u>4/</u>	42,511	5	Transportation and utilities <u>4/</u>	35,639
6	Mining	27,595	6	Construction	27,750
7	Construction	25,995	7	Mining	26,359
8	Public administration	16,928	8	Public administration	20,104
9	Finance, insurance, and real estate	7,652	9	Finance, insurance, and real estate	10,672
10	Forestry and fisheries	3,052	10	Forestry and fisheries	2,469
Southern Region					
1	Manufacturing	1,489,739	1	Manufacturing	1,666,080
2	Wholesale and retail trade <u>2/</u>	800,847	2	Services <u>3/</u>	972,887
3	Services <u>3/</u>	705,543	3	Wholesale and retail trade <u>2/</u>	896,785
4	Agriculture	565,709	4	Agriculture	385,873
5	Transportation and utilities <u>4/</u>	289,191	5	Transportation and utilities <u>4/</u>	292,142
6	Construction	222,204	6	Construction	237,577
7	Public administration	137,501	7	Finance, insurance, and real estate	174,432
8	Finance, insurance, and real estate	126,991	8	Public administration	173,554
9	Mining	6,786	9	Mining	9,354
10	Forestry and fisheries	2,555	10	Forestry and fisheries	1,982

1/ The industries in this table, and the industry tables and figures that follow, have the same components as designated by the Bureau of the Budget, "Standard Industrial Classification Manual," 1957, for agriculture; forestry and fisheries; mining; construction; manufacturing; finance, insurance, and real estate; and public administration. 2/ Wholesale and retail trade includes whole-sale trade; food product stores; eating and drinking places; and other retail trade. 3/ Services include business services; repair services; private house-hold; other personal services; entertainment and recreation services; hospitals; government educational services; private educational services; welfare and religious organizations; and other professional and related services. 4/ Transportation and utilities include railroads; trucking and warehousing; other transportation; communications; and utilities.

Source: U.S. Census of Population, 1950 and 1960 (79).

Table 18.--Changes in employment in growing industries, United States and Northern and Southern Lake States Regions, 1950-60

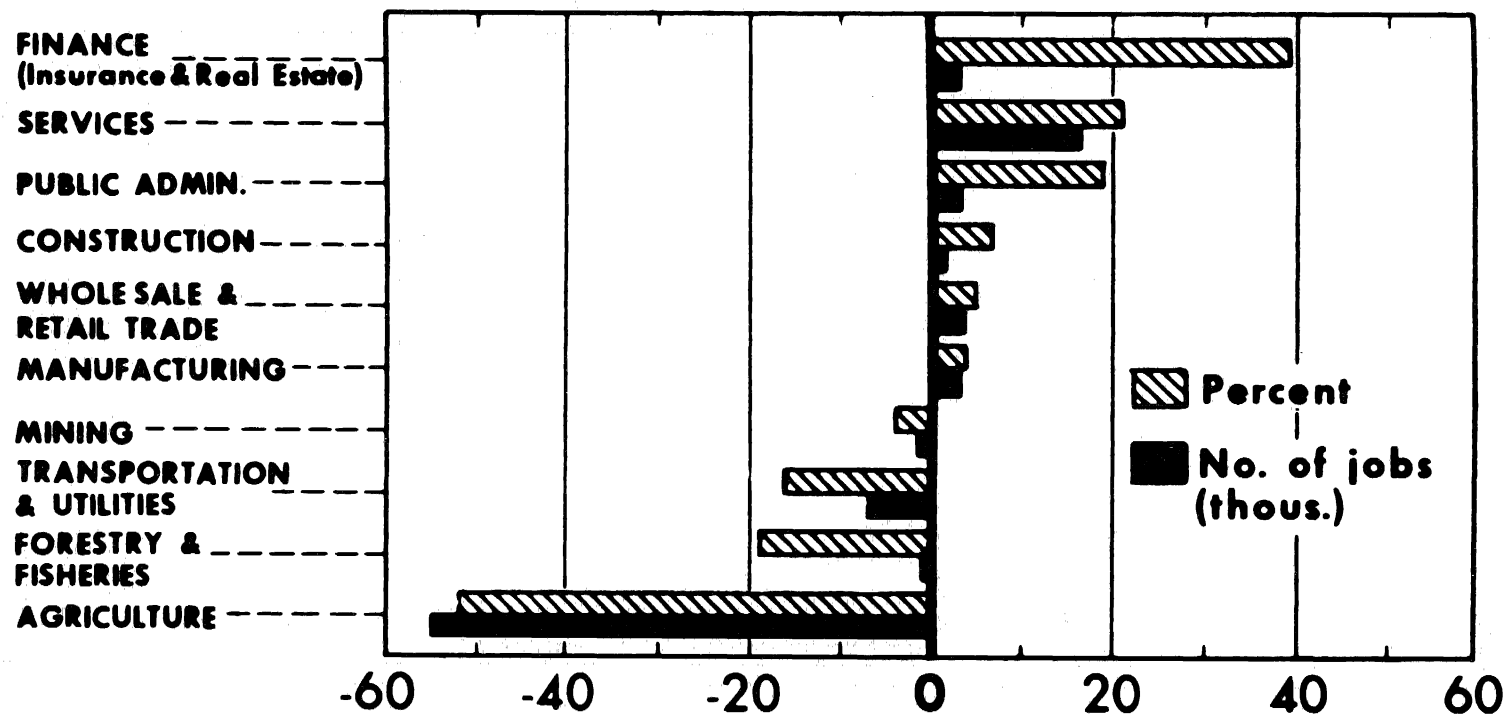
Growing U.S. industries	: Increase in: : number of : jobs in : U.S. :	Change in number of jobs					
		Northern Region			Southern Region		
		: Actual : change :	: Change required : to equal U.S. : growth rate :	: Difference : from U.S. : rate :	: Actual : change :	: Change required : to equal U.S. : growth rate :	: Difference : from U.S. : rate :
				<u>Jobs</u>			
Services -----	: 3,457,301	16,600	26,882	-10,282	267,344	242,001	25,343
Manufacturing ----	: 2,827,604	3,696	17,393	-13,697	176,341	287,520	-111,179
Wholesale and retail trade ----	: 1,285,304	3,903	10,052	-6,149	95,938	97,703	-1,765
Finance, insurance, real estate -----	: 775,020	3,020	3,091	-71	47,441	51,304	-3,863
Public admini- stration -----	: 688,742	3,176	4,638	-1,462	36,053	37,675	-1,622
Construction -----	: 357,957	1,755	2,703	-948	15,373	15,332	41
Transportation and utilities -----	: 8,286	-6,872	85	-6,957	2,951	578	2,373
Total for growing industries -----	: 9,400,214	25,278	64,844	-39,566	641,441	732,113	-90,672

Source: U.S. Census of Population, 1950 and 1960 (79).

By Industry

CHANGES IN EMPLOYMENT, 1950-60

Northern Lake States Region



SOURCE: U.S. CENSUS OF POPULATION, 1950 AND 1960

U. S. DEPARTMENT OF AGRICULTURE

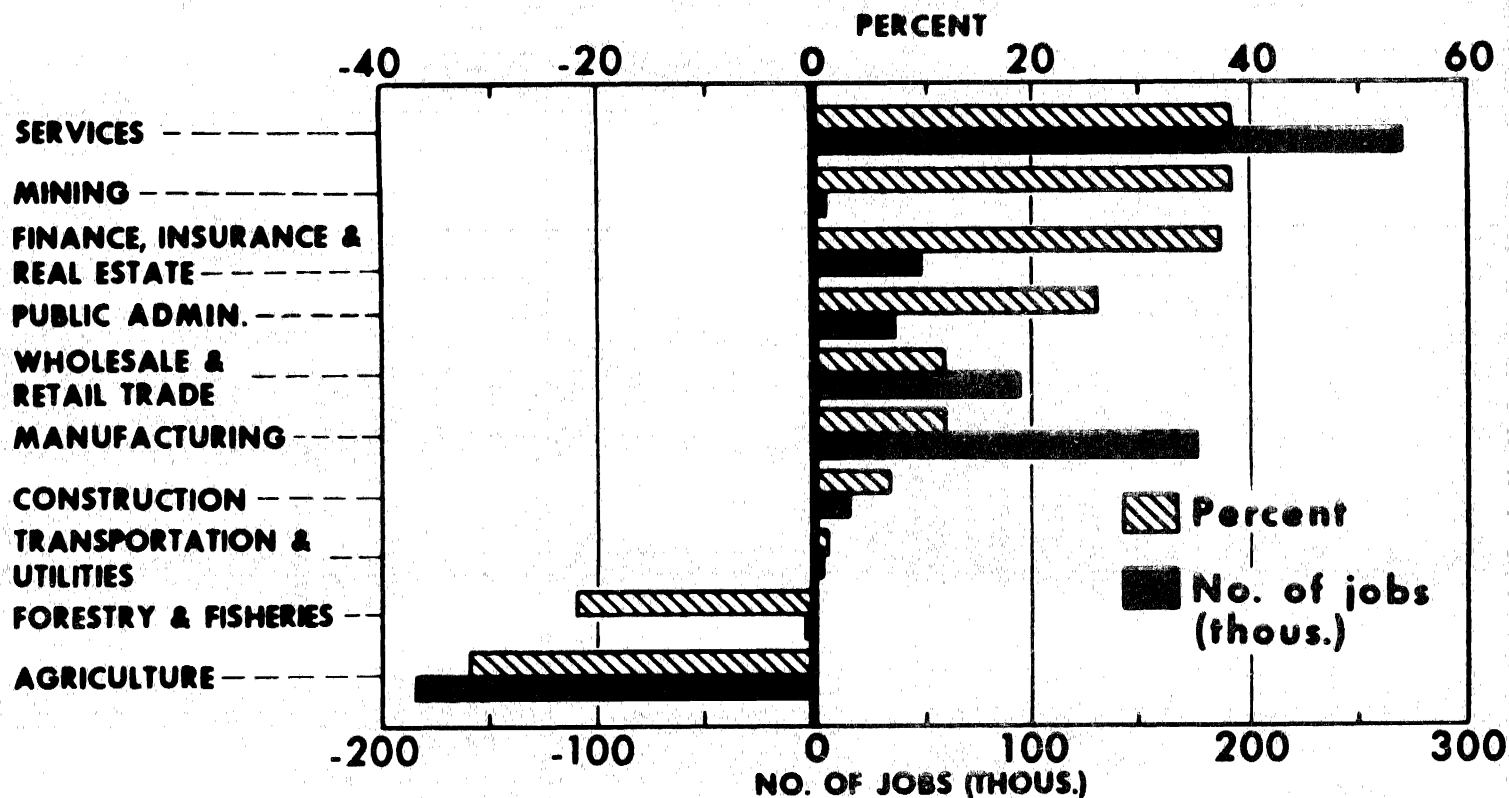
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Figure 10

By Industry

CHANGE IN EMPLOYMENT, 1950-60

Southern Lake States Region



SOURCE: U.S. CENSUS OF POPULATION 1950-60

U.S. DEPARTMENT OF AGRICULTURE

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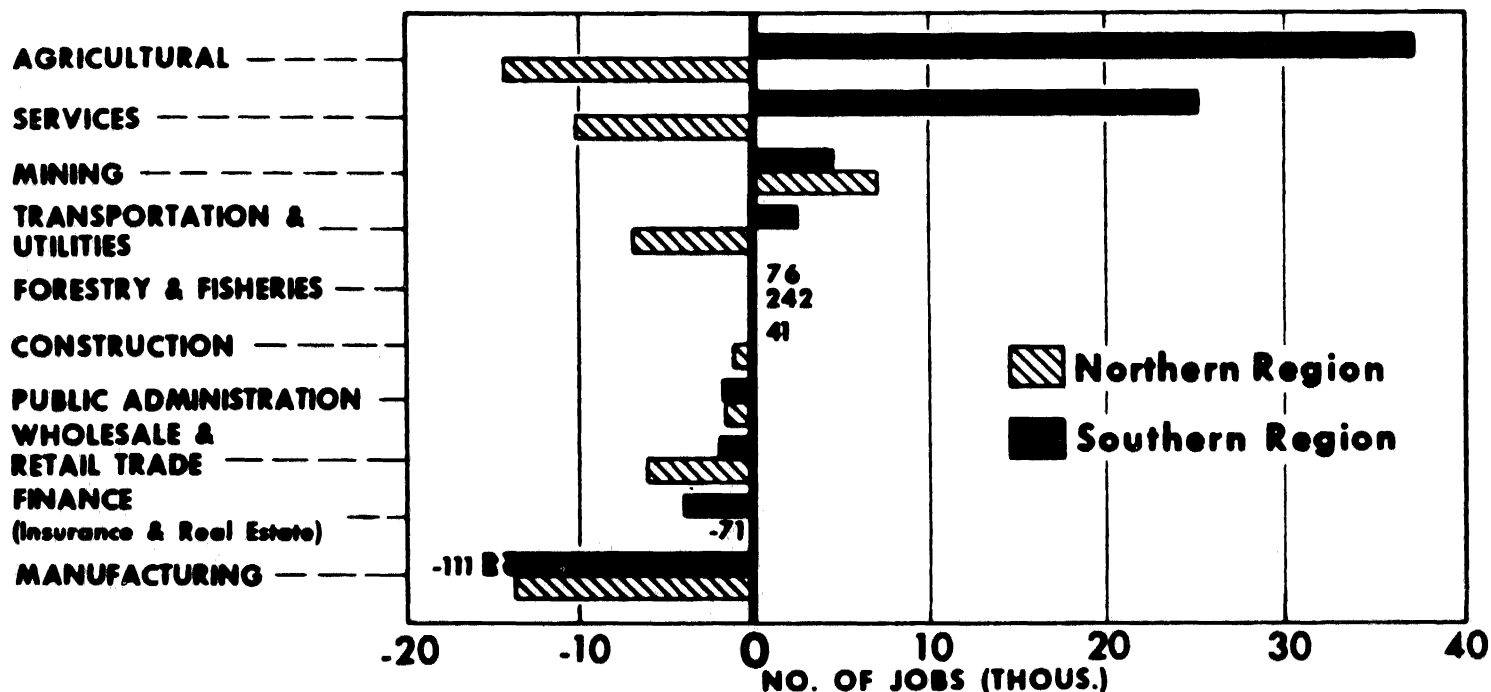
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Figure 11

By Industry

CHANGES IN EMPLOYMENT RELATIVE TO U.S. CHANGES, 1950-60*

Northern and Southern Lake States Regions



*A ZERO REGIONAL CHANGE IS EQUIVALENT TO THE SAME RATE OF CHANGE AS THE U.S.

U.S. DEPARTMENT OF AGRICULTURE

SOURCE: U.S. CENSUS OF POPULATION, 1950 AND 1960.

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Figure 12

employment declined in mining and in forestry and fisheries in the United States and in the NR. But the decline was at a slower rate in the NR than in the United States. Therefore, relative to the United States the NR gained in employment in these two industries.

In the SR, four industries -- agriculture, mining, transportation and utilities, and services -- added jobs at a faster rate or lost jobs at a slower rate than the United States between 1950 and 1960. Therefore, these were classified as growth industries (table 19). Manufacturing, with the largest employment, is classified as declining. All industries combined in both the Northern and Southern Regions increased at a slower rate than in the United States.

The largest occupational group in the northern counties in 1950 was operatives. 11/ The next largest group was farmers and farm managers (table 20). By 1960, operatives still ranked first, but farmers and farm managers ranked seventh.

In the Southern Region, the rank of the first four occupational groups remained the same between 1950 and 1960. Farmers and farm managers, fifth in 1950, were eighth in 1960. 12/

In both regions farmers and farm laborers declined in numbers and percentage (figs. 13 and 14). The greatest gain in number of jobs in both regions was among professional and technical workers. Service and clerical occupations also showed substantial increases in number of jobs.

These shifts in occupations are consistent with trends toward a more technical and complex labor force and toward stronger demand for professional and technical workers rather than laborers. The growth in clerical occupations complements the growth in professional and technical occupations. The increased demand for service workers is also complementary and reflects the trend toward packaging more services with commodities.

Numbers of farmers and farm managers were declining at a faster rate in the United States between 1950 and 1960 than in the Southern Region (fig. 15). However, in the NR numbers were declining at a more rapid rate than for the Nation. Private household workers were the only occupational group that was increasing more rapidly in both the Southern and Northern Regions than for the Nation.

Employment in manufacturing in the Lake States declined relative to the United States, with the same pattern for craftsmen and operatives.

In the Northern Region, the only "relative growth" occupational group was household workers (table 21). In the Southern Region the "relative growth"

11/ Operatives include bus drivers, deliverymen, taxicab drivers, truck drivers, apprentices, assemblers, auto service and parking attendants, boatmen, graders and sorters in manufacturing, laundry and dry cleaning operatives, meat cutters, oilers and greasers, railroad brakemen and switchmen, and others.

12/ See appendix table 76 for a percentage distribution of employed persons by occupation, 1950 and 1960, and appendix table 77 for a percentage distribution of unemployed persons by occupation, 1950 and 1960.

Table 19.--Changes in employment, Northern and Southern Lake States Regions and United States, by industry, 1950-60

Industry	Change in number of employed persons			Relative changes, Regions vs. United States	
	Northern Region	Southern Region	United States	Northern Region	Southern Region
Agriculture -----	Decrease	Decrease	Decrease	<u>1</u> /Decline	<u>2</u> /Growth
Forestry and fisheries --	Decrease	Decrease	Decrease	Growth	Same as U.S.
Mining -----	Decrease	Increase	Decrease	Growth	Growth
Construction -----	Increase	Increase	Increase	Decline	Same as U.S.
Manufacturing -----	Increase	Increase	Increase	Decline	Decline
Transportation and utilities -----	Decrease	Increase	Increase	Decline	Growth
Wholesale and retail trade -----	Increase	Increase	Increase	Decline	Decline
Finance, insurance, and real estate -----	Increase	Increase	Increase	Decline	Same as U.S.
Services -----	Increase	Increase	Increase	Decline	Growth
Public administration --	Increase	Increase	Increase	Decline	Decline
All industries -----	Decrease	Increase	Increase	Decline	Decline

1/ Decline means that the region increased less or decreased more relative to United States.

2/ Growth means that the region increased more or decreased less relative to United States.

Source: U.S. Census of Population, 1950 and 1960 (79).

Table 20.--Ranking of occupations by number of persons employed, Northern and Southern Lake States Regions, 1950 and 1960

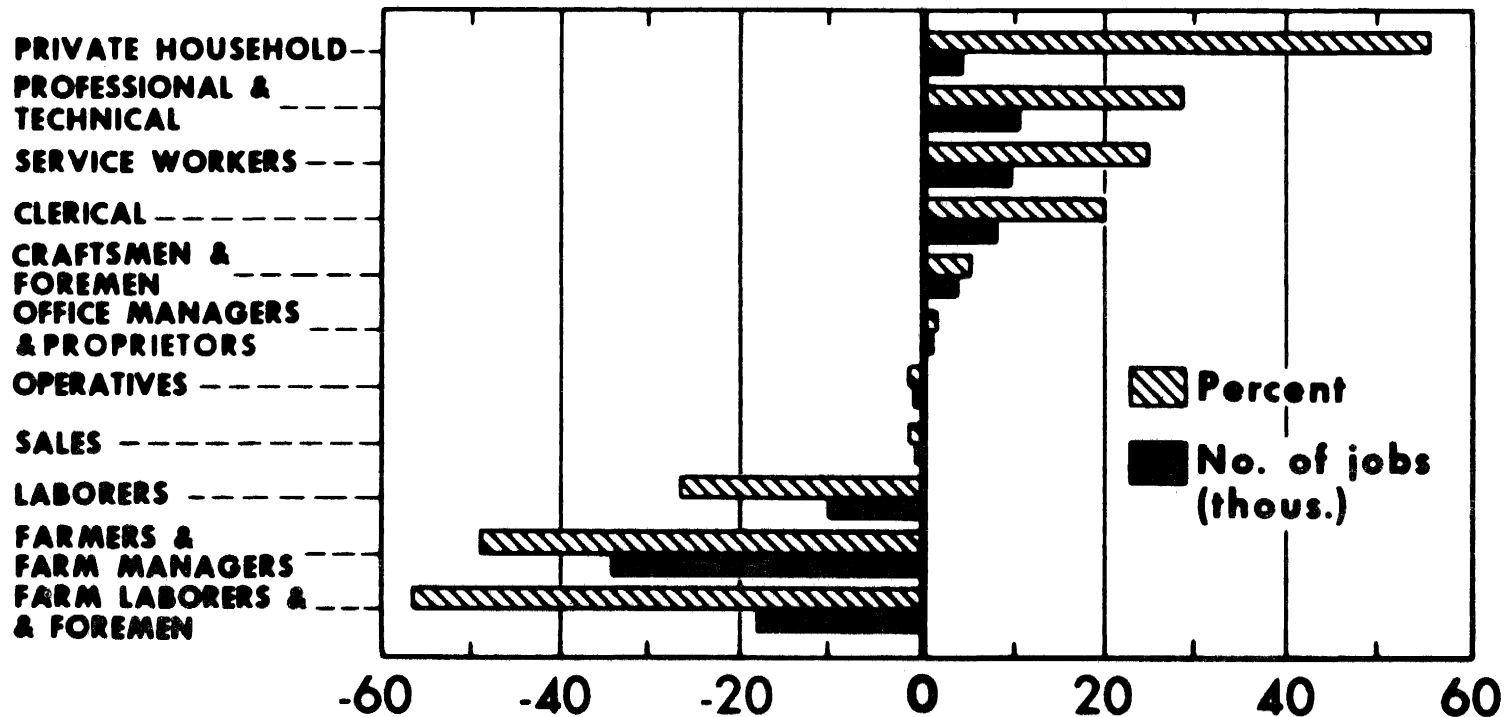
1950			1960		
Rank	Occupation	Number of employees	Rank	Occupation	Number of employees
Northern Region					
1	Operatives	87,675	1	Operatives	87,126
2	Farmers and farm managers	70,652	2	Craftsmen and foremen	64,810
3	Craftsmen and foremen	61,747	3	Professional and technical	45,390
4	Office managers and proprietors	42,819	4	Clerical	44,932
5	Clerical	37,453	5	Service workers	44,976
6	Laborers	36,958	6	Office managers and proprietors	43,294
7	Service workers	35,836	7	Farmers and farm managers	36,138
8	Professional and technical	35,309	8	Sales	28,160
9	Farm laborers and foremen	31,341	9	Laborers	27,048
10	Sales	28,533	10	Farm laborers and foremen	13,327
11	Private household	6,923	11	Private household	10,791
Southern Region					
1	Operatives	961,056	1	Operatives	993,745
2	Craftsmen and foremen	658,474	2	Craftsmen and foremen	705,361
3	Clerical	538,605	3	Clerical	695,237
4	Professional and technical	374,027	4	Professional and technical	555,315
5	Farmers and farm managers	369,162	5	Service workers	423,331
6	Office managers and proprietors	354,023	6	Sales	367,545
7	Service workers	326,382	7	Office managers and proprietors	365,035
8	Sales	310,285	8	Farmers and farm managers	267,335
9	Laborers	205,106	9	Laborers	190,464
10	Farm laborers and foremen	189,662	10	Farm laborers and foremen	104,553
11	Private household	70,624	11	Private household	99,582

Source: U.S. Census of Population, 1950 and 1960 (79).

By Occupation

CHANGE IN EMPLOYMENT, 1950-60

Northern Lake States Region



SOURCE: U.S. CENSUS OF POPULATION, 1950 AND 1960

U. S. DEPARTMENT OF AGRICULTURE

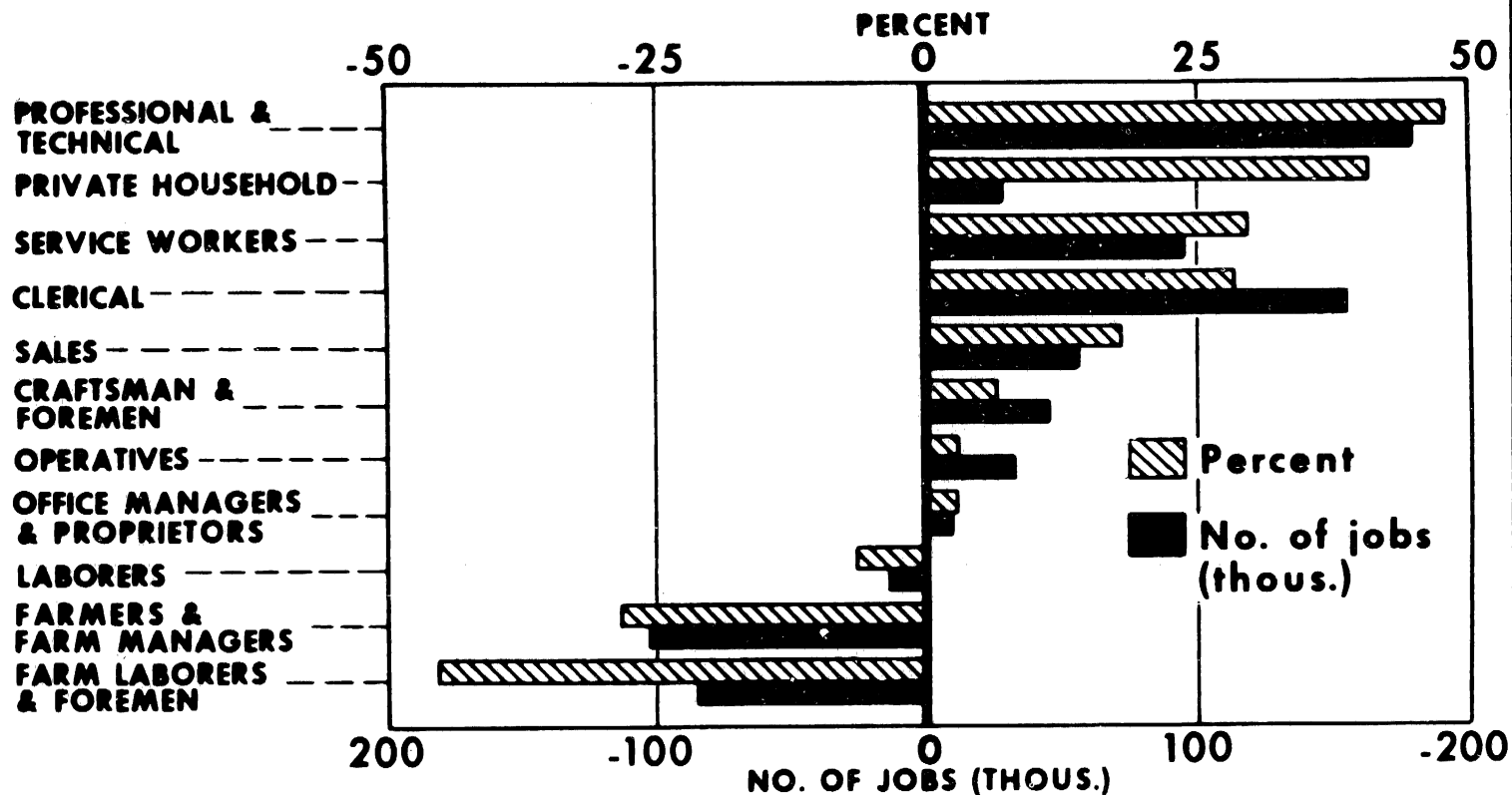
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Figure 13

By Occupation

CHANGE IN EMPLOYMENT, 1950-60

Southern Lake States Region



SOURCE: U.S. CENSUS OF POPULATION, 1950 AND 1960

U.S. DEPARTMENT OF AGRICULTURE

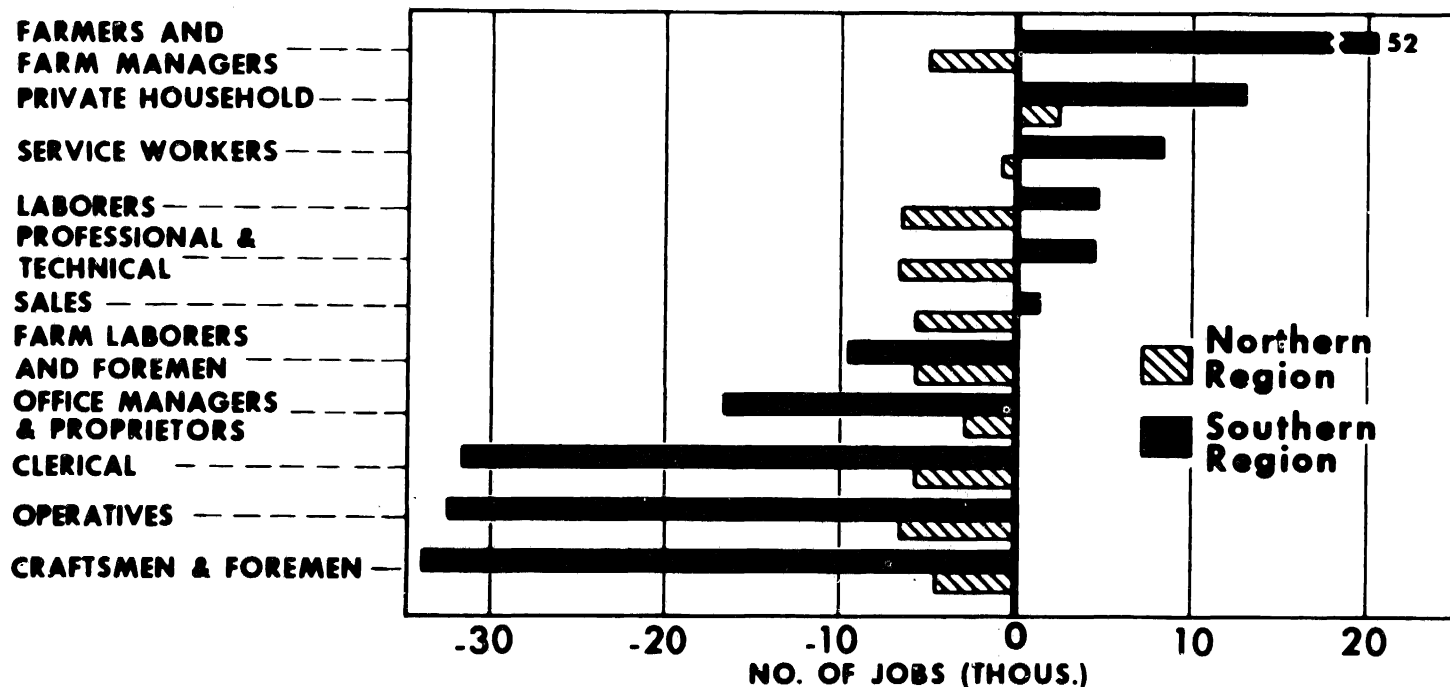
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Figure 14

By Occupation

CHANGES IN EMPLOYMENT RELATIVE TO U.S. CHANGES, 1950-60*

Northern and Southern Lake States Regions



*A ZERO REGIONAL CHANGE IS EQUIVALENT TO THE SAME RATE OF CHANGE AS THE U.S.

SOURCE: U.S. CENSUS OF POPULATION, 1950 AND 1960.

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Figure 15

Table 21.--Changes in employment, Northern and Southern Lake States Regions and United States, by occupation, 1950-60

Occupation	Change in number of employed persons			Relative change, Regions vs. United States	
	Northern Region	Southern Region	United States	Northern Region	Southern Region
Professional and technical -----	Increase	Increase	Increase	Decline	Growth
Farmers and farm managers -----	Decrease	Decrease	Decrease	Decline	Growth
Office managers and proprietors -----	Increase	Increase	Increase	Decline	Decline
Clerical -----	Increase	Increase	Increase	Decline	Decline
Sales -----	Decrease	Increase	Increase	Decline	Growth
Craftsmen and foremen --	Increase	Increase	Increase	Decline	Decline
Operatives -----	Decrease	Increase	Increase	Decline	Decline
Private household -----	Increase	Increase	Increase	Growth	Growth
Service workers -----	Increase	Increase	Increase	Decline	Growth
Farm laborers and foremen -----	Decrease	Decrease	Decrease	Decline	Decline
Laborers -----	Decrease	Decrease	Decrease	Decline	Growth
Total -----	Decrease	Increase	Increase	Decline	Decline

Source: U.S. Census of Population, 1950 and 1960 (79).

occupations were professional and technical, farmers, sales, private household, service workers, and laborers. Two of these occupational groups -- farmers and laborers -- declined in number of jobs between 1950 and 1960, but at a slower rate than the U.S. rate.

INCOME

Family Income

The U.S. and Lake States level of family income improved over the 10-year period 1949-59. During this period, the proportion of families with poverty-level incomes (\$2,000 in 1949 and \$3,000 in 1959) decreased from 29 to 21 percent in the Nation; from 37 to 27 percent in the Northern Region; and from 20 to 16 percent in the Southern Region (table 22). Percentages of families in each county of the Lake States with incomes under \$3,000 in 1959 are shown by frequency groups in figure 16.

In 1959, a higher proportion of families in the SR were in the higher income levels than families in the United States (table 22). However, a higher proportion of families in the NR were in the lower income levels. For example, 54 percent of all families in the NR had incomes less than \$5,000, compared with only 34 percent of the families in the Southern Region. Furthermore, only 7 percent of the NR families and 17 percent of the SR families had incomes over \$10,000.

Census data permit comparisons of income levels among farm, rural nonfarm, and urban families. However, there were differences in the classification of families by income in 1950 and 1960. In the 1950 census, urban and rural nonfarm families cannot be identified, for their incomes are combined with incomes

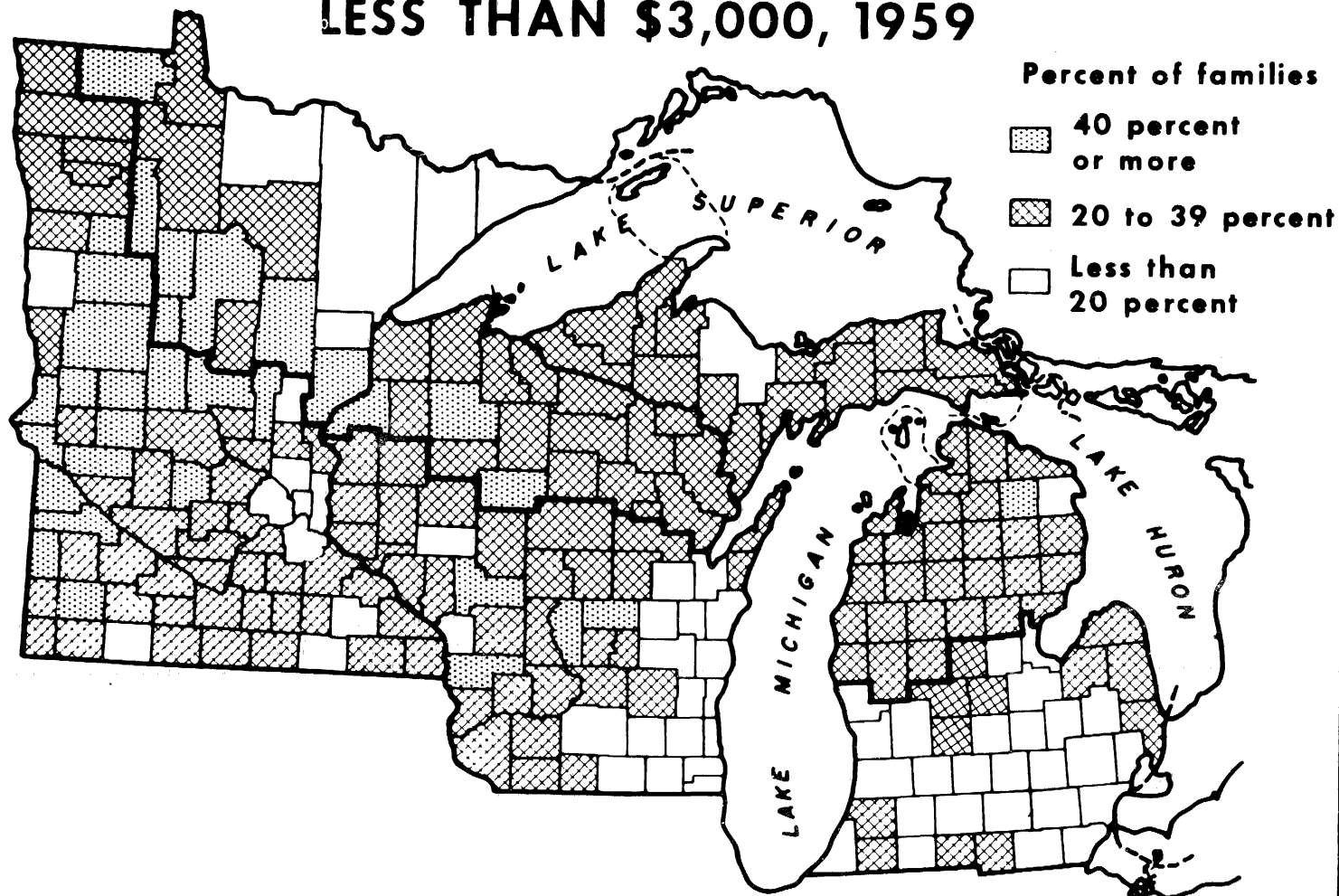
Table 22.--Percentage distribution of families with income below specified levels, Northern and Southern Lake States Regions, and United States, 1949 and 1959

Income level	1949			1959		
	Northern Region	Southern Region	United States	Northern Region	Southern Region	United States
	Percent					
\$1,000 -----	18	10	14	6	4	6
2,000 -----	37	20	29	16	10	13
3,000 -----	61	38	48	27	16	21
4,000 -----	80	61	68	40	24	31
5,000 -----	90	76	80	54	34	42
6,000 -----	94	85	88	68	48	54
7,000 -----	97	91	92	78	60	65
8,000 -----	1/	1/	1/	85	70	74
9,000 -----	1/	1/	1/	90	78	80
10,000 -----	99	97	97	93	83	85

1/ Not available in the 1950 Census of Population.

Source: U.S. Census of Population, 1950 and 1960 (79).

PERCENTAGE OF FAMILIES WITH INCOME LESS THAN \$3,000, 1959



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Figure 16

of unrelated individuals (persons who are not members of families). In the 1960 census, it is possible to compare 1959 income of urban, rural nonfarm, and farm families. ^{13/} Income comparisons cannot be made between 1949 and 1959, but comparisons can be made among groups within each census year.

Sixty percent of farm families and individuals living in the NR in 1949 had incomes of less than \$2,000 (table 23), and over 80 percent had incomes of less than \$3,000. Farm families of the SR had about the same income as urban and rural nonfarm families of the NR, with 46 and 41 percent of the families, respectively, having incomes of less than \$2,000 in 1949. The urban and rural nonfarm families living in the SR had the highest proportion of families in the higher income groups. Within each category by residence, a higher proportion of the families in the Northern Region had low incomes.

For 1959, 44 percent of farm families in the NR and 40 percent in the SR had incomes under \$3,000 (table 24); this family group had the highest incidence of poverty. Only 12 percent of urban families in the SR and 18 percent in the NR had incomes of less than \$3,000; this group had the lowest poverty rate.

^{13/} Inclusion of unrelated individuals with family data gives a downward bias to family income levels.

Table 23.--Percentage distribution of urban and rural nonfarm families and individuals, and farm families and individuals, with income below specified levels, Northern and Southern Lake States Regions, 1949

Income level	Urban and rural nonfarm		Farm	
	Northern Region	Southern Region	Northern Region	Southern Region
	Percent			
\$1,000 -----	25	17	33	23
2,000 -----	41	28	60	46
3,000 -----	63	45	82	66
4,000 -----	81	66	92	81
5,000 -----	90	79	95	89
6,000 -----	95	87	97	93
7,000 -----	97	92	99	96
10,000 -----	99	97	100	99

Source: U.S. Census of Population, 1950 (79).

Table 24.--Percentage distribution of urban, rural nonfarm,
and farm families, with income below specified levels,
Northern and Southern Lake States Regions, 1959

Income level	Urban		Rural nonfarm		Farm		Rural population (rural nonfarm + farm)	
	North-	South-	North-	South-	North-	South-	North-	South-
	ern Region	ern Region	ern Region	ern Region	ern Region	ern Region	ern Region	ern Region
	Percent							
\$1,000	3	3	6	5	9	10	7	7
2,000	10	7	18	12	27	24	20	16
3,000	18	12	30	19	44	40	33	26
4,000	29	19	44	29	59	53	47	37
5,000	43	28	59	42	72	65	62	50
6,000	59	42	73	57	82	74	75	63
7,000	71	55	82	69	88	81	84	74
8,000	80	66	88	78	92	86	89	81
9,000	86	74	92	85	95	90	93	86
10,000	90	81	95	89	96	92	95	90

Source: U.S. Census of Population, 1960 (79).

Personal Income 14/

Personal per capita income in the Lake States increased from less than \$1,400 in 1947 to over \$2,400 by 1963(82). From 1947 to 1957, per capita personal income was slightly greater in the Lake States than in the Nation. Since 1957 there has been little difference between the Lake States and the U.S. average. Per capita personal income in Michigan averaged about \$400 more for the 17-year period than in Wisconsin or Minnesota.

Buying Income

The income measure used here is net effective buying income. It is equivalent to disposable personal income, or personal income minus taxes.

Net effective buying income per capita in the United States increased 70 percent (\$1,311 to \$2,225) from 1950 to 1964 (table 25). The increase in the SR for the same period was 63 percent, but the absolute level of buying income per capita was slightly above the U.S. average. In the NR this figure was about

14/ Personal income is the current income received by individuals, unincorporated businesses, and nonprofit institutions. It includes transfer payments from government and business, but excludes transfers among persons. Important nonmonetary inclusions are estimated rental value of owner-occupied homes and value of food produced for home use.

Table 25.--Effective buying income, per capita and per household, Northern and Southern Lake States Regions and United States, 1950, 1960, and 1964

Effective buying income, by year	Northern Region	Southern Region	United States
	<u>Dollars</u>		
Per capita:			
1950 -----	1,089	1,399	1,311
1960 -----	1,491	2,060	1,974
1964 -----	1,681	2,287	2,225
Per household:			
1950 -----	3,684	5,112	4,521
1960 -----	4,770	6,984	6,723
1964 -----	5,711	7,981	7,542

Source: Sales Management Magazine (5-7). (Permission to use copyrighted data was granted by the publisher).

\$300 less than in the SR in 1950 and \$400 less in 1964 (fig. 17). In southern Michigan, a highly industrialized area, the effective buying income per capita was \$2,000 or more in most of the counties. High incomes in southern Wisconsin and Minnesota were also concentrated around the larger industrialized cities.

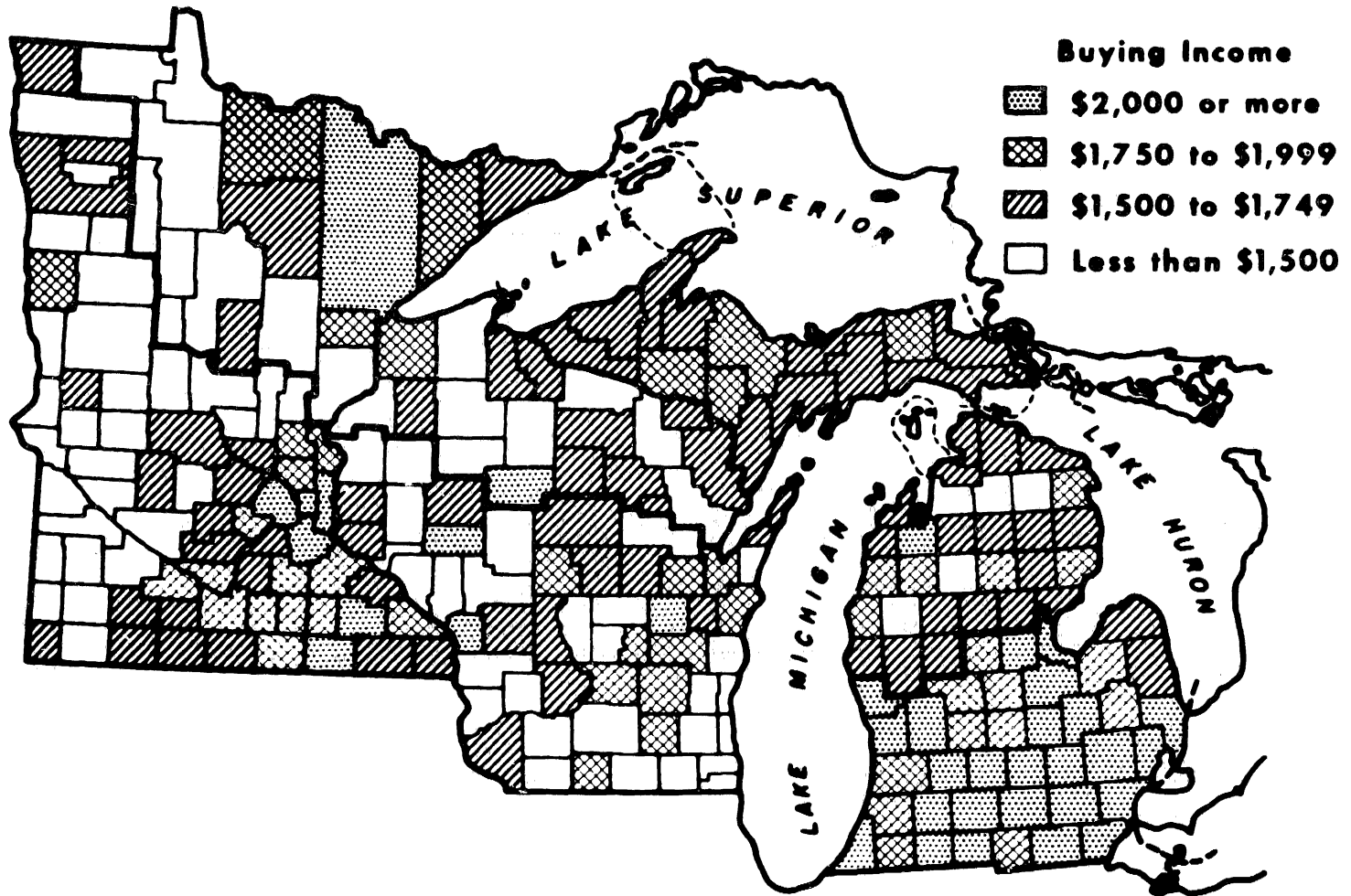
Another measure of effective buying income is income per household. The major consumer-spending unit is the household. Buying income per household in the United States increased 67 percent from \$4,521 to \$7,542 from 1950 to 1964 (table 25). This is less than the per capita gain of 70 percent. However, in the NR there was little difference in increase of per capita and per household buying income from 1950 to 1964 -- 54 and 55 percent, respectively. Buying income per household in the SR was slightly above the U.S. average in 1964. In the NR the average was over \$2,000 lower than in the SR.

COMMUNITY FACILITIES

Local government provides many services such as law enforcement, the public school system, public health assistance, public welfare assistance, and roads.^{15/} In 1962, NR and SR local government employees made up 8 and 6 percent, respectively, of the employed labor force (table 26).

^{15/} Local government units, as defined by the U.S. Census of Governments, 1962, include five types of units: Counties, municipalities, townships, school districts, and special districts.

NET EFFECTIVE BUYING INCOME PER CAPITA, 1964



U.S. DEPARTMENT OF AGRICULTURE

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ECONOMIC RESEARCH SERVICE

Figure 17

Table 26.--Selected data on local governments, Northern and Southern Lake States Regions, 1962

Item	Unit	Northern Region				Southern Region			
		Mich.	Wis.	Minn.	Total	Mich.	Wis.	Minn.	Total
Percentage of labor force employed in local governments --	Pct.	8	8	9	8	7	6	6	6
Percentage of counties with --									
Fewer than 40 local government employees -----	Pct.	53	61	81	61	18	28	24	24
40 to 49 local government employees -----	Pct.	42	39	19	37	64	49	39	48
50 or more local government employees -----	Pct.	5	0	0	2	18	23	37	28
Average population per local government employee, per county -----	Persons	38	38	34	37	42	42	45	43
Expenditures per capita for local government, all counties -----	Dollars	209	265	288	246	235	269	256	249

Source: Population based on 1960 U.S. Census of Population (79). Expenditures for local government employment based on 1962 U.S. Census of Governments (76).

Local Government Employment and Expenditures

Local government can serve more people per employee in densely populated areas than in sparsely populated areas. In the northern counties with sparser population, there were about 37 people per local government employee, compared with 43 in the southern counties (table 26). Yet, local government expenditures per capita were nearly identical for the Northern and Southern Regions. However, there was substantial variation among counties. Average local government expenditures per capita for the Michigan counties in the Northern Region were only \$209, compared with \$288 for the Northern Minnesota counties (table 26).

The following tabulation shows that there was considerable variation among the three Lake States in number of local governments.

State	Number of local governments	Local governments per 100,000 population	Local governments per county area
Michigan ----:	3,818	48	46
Wisconsin ---:	3,726	93	52
Minnesota ---:	5,212	151	60

Taxation

The major source of revenue to support local government is the general property tax. ^{16/} General property taxes levied in 1964 were \$114 per capita in the Northern Region, and \$138 in the Southern Region (table 27). Counties of Northern Michigan, with the lowest expenditures per capita, had the lowest general property tax per capita (\$83). A large proportion of local government expenditures is for public schools. Educational expenditures per pupil were lower (\$481) in the NR than in the SR (\$563) (table 13). Property tax per capita was also lower in the NR (\$114) than in the SR (\$138).

The property tax is only one source of revenue for local governments. Other sources include other forms of taxation, sale of services, and transfer payments from State and Federal governments. By comparing local government expenditures per capita (table 26) with property taxes per capita (table 27), revenue from property taxes accounts for about 45 percent of expenditures in the NR, compared with 55 percent in the SR. ^{17/} This fragmentary information suggests that a higher proportion of local government expenditures is financed by transfer payments in the NR than in the SR. Additional research is needed on these and similar questions to determine the effect on economic growth.

Public Assistance Payments

The major per capita public assistance case loads in 1960 were in the Southeastern and Southern Rocky Mountain Regions (fig. 18). The Northern Region of the Lake States also had high public assistance case loads per capita.

Public assistance payments are shared by local, State, and Federal Government units. Payments in the Northern Region were approximately \$22 per capita in fiscal 1964 (table 28), but only \$16 per capita in the Southern Region. Some counties of northern Wisconsin averaged \$31 per capita, compared with \$14 per capita for southern Michigan counties.

^{16/} The general property tax levied is on real estate property. However, data for Minnesota include personal property as well.

^{17/} These data pertain to 2 different years, 1962 expenditures and 1964 taxes levied, but given the stability of local government expenditures and tax patterns, the relationship is a good approximation.

Table 27.--Total and per capita general property taxes levied, Northern and Southern Lake States Regions, 1964 1/

Taxes levied	Northern Region				Southern Region			
	Mich.	Wis.	Minn. <u>2/</u>	Total	Mich.	Wis.	Minn. <u>2/</u>	Total
	----- Dollars -----							
Total (thousands)	59,755	33,272	78,965	171,992	931,479	549,005	532,487	2,012,971
Per capita -	83	113	160	114	124	140	171	138

1/ Wisconsin data are for taxes levied in 1963 and collected in 1964.

2/ Includes personal property taxes as well as real estate taxes.

Source: Michigan State Tax Commission (unpublished), Wisconsin Department of Taxation (101) and Minnesota State Auditor (46). For 1964 population estimate, see table 2.

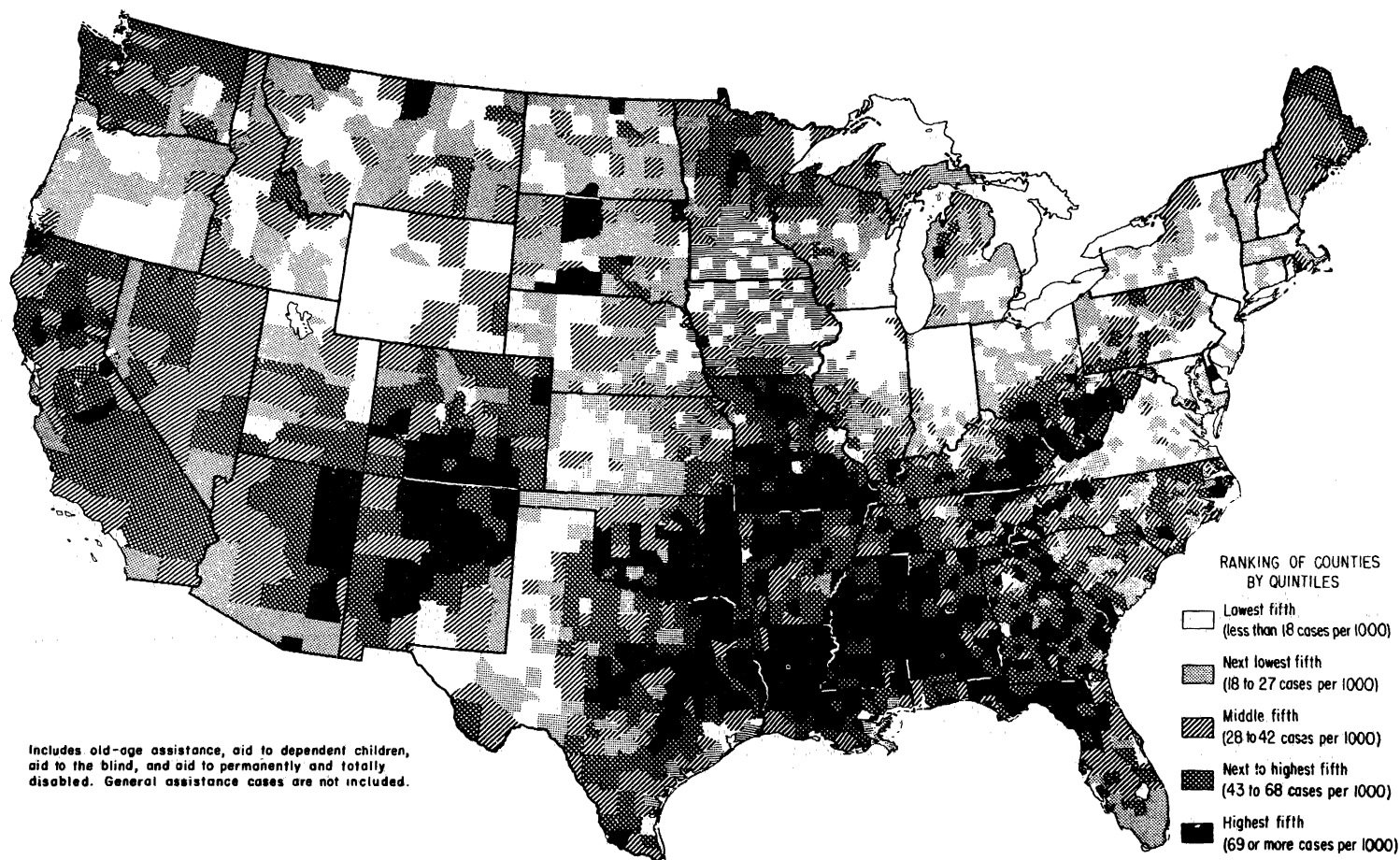
Table 28.--Local, State, and Federal Government payments for old-age assistance, aid to dependent children, the blind, and the disabled, Northern and Southern Lake States Regions, fiscal 1964

Payments	Northern Region				Southern Region			
	Mich.	Wis.	Minn.	Total	Mich.	Wis.	Minn.	Total
	----- Dollars -----							
Total (thousands)	13,335	9,150	10,204	32,688	103,010	60,213	71,268	234,491
Per capita <u>1/</u> -	19	31	21	22	14	15	23	16

1/ Based on 1964 population estimates (Sales Management Magazine 7).

Source: Michigan Social Welfare Commission (29) and Wisconsin State Department of Public Welfare (104). Tables obtained by personal correspondence, Minnesota Social Welfare Commission.

PUBLIC ASSISTANCE CASE LOAD, DECEMBER 1960



U.S. DEPARTMENT OF AGRICULTURE

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ECONOMIC RESEARCH SERVICE

Figure 18

The higher per capita public assistance payments in the NR may be partially attributed to the selectivity of outmigration. In 1960, 20 percent of the NR population were over 55 years of age, compared with 18 percent of the population in the SR. Older persons and the handicapped are not very mobile, thereby increasing the per capita incidence of those requiring public assistance.

Health

Another measure of the general well-being of the population is the number of registered physicians per 100,000 population. The United States has an abundance of medical doctors and facilities relative to those of other countries. But within the Lake States the number of registered physicians in 1965 per 100,000 population varied from only 92 in the Northern Region to 127 in the Southern Region (table 29). Minnesota ranks substantially above the other States, with Northern Minnesota having more physicians per capita than either the Northern or Southern Regions of Wisconsin and Michigan.

Table 29.--Registered medical physicians, Northern and Southern Lake States Regions, 1965

Item	Northern Region				Southern Region			
	Mich.	Wis.	Minn.	Total	Mich.	Wis.	Minn.	Total
	----- <u>Number</u> -----							
Number of physicians--	567	179	632	1,378	9,209	4,601	4,712	18,522
Population estimates, 1964 ^{1/} (thousands)--	718	294	492	1,504	7,542	3,921	3,109	14,572
Physicians per 100,000 of population -----	79	61	128	92	122	117	152	127

^{1/} Sales Management Magazine (7).

Source: American Medical Association (2).

Housing

The U.S. Census of Housing rated houses as sound, deteriorating, or dilapidated. In 1960, the proportion of dwelling units in the Southern Region rated as sound (86 percent) exceeded that in the United States (81 percent) (table 30). In the Northern Region, 78 percent of all houses were classified as sound.

Between 1950 and 1960, the condition of dwelling units improved in both the Northern and Southern Regions, but improved slightly more in northern than in southern counties.

Table 30.--Number and percentage of dwelling units, by condition, Northern and Southern Lake States Regions and United States, 1950 and 1960

Condition of dwelling units	1950			1960		
	Northern Region	Southern Region	United States	Northern Region	Southern Region	United States
	<hr/> ----- <u>Number</u> ----- <hr/>					
Sound -----	1/488,935	1/3,235,864	1/40,162,719	499,790	3,695,208	47,350,756
Deterio- rating ---	--	--	--	106,702	490,006	8,075,676
Dilapidated:	53,752	167,288	4,339,473	34,258	128,053	2,891,865
Total :	542,867	3,403,152	44,502,192	640,750	4,313,267	58,318,297
	<hr/> ----- <u>Percent</u> ----- <hr/>					
Sound -----	1/90	1/95	1/90	78	86	81
Deterio- rating ---	--	--	--	17	11	14
Dilapidated:	10	5	10	5	3	5
Total :	100	100	100	100	100	100

1/ Separate classification of sound and deteriorating housing units not available in the 1950 census.

Source: U.S. Census of Housing, 1950 and 1960 (80).

Banking

Between 1950 and 1960, total bank deposits in the NR increased 71 percent -- from about \$728 million to \$1,242 million -- while bank deposits in the SR increased only 66 percent -- from \$9,591 million to \$15,967 million (table 31). However, the relative growth of deposits of the two regions reversed between 1960 and 1964. Total deposits advanced 35 percent in the SR and 24 percent in the NR during this period. From 1950 to 1964, bank deposits increased 125 percent in the southern counties and 112 percent in the northern counties.

Bank deposits per capita doubled in the Northern Region between 1950 and 1964, but increased only 75 percent in the Southern Region. The per capita gain between 1960 and 1964 was greater in the SR. Bank deposits per capita were higher in the SR (\$1,482) than in the NR (\$1,028) in 1964.

Table 31.--Total and per capita deposits for all banks, Northern and Southern Lake States Regions, 1950, 1960, and 1964

Item and year	Northern Region				Southern Region			
	Mich.	Wis.	Minn.	Total	Mich.	Wis.	Minn.	Total
	<hr/> ----- <u>Mil. dol.</u> -----							
Total deposits:								
1950 -----	310	139	280	728	4,783	2,598	2,210	9,591
1960 -----	546	235	461	1,242	7,985	4,151	3,831	15,967
1964 -----	725	287	533	1,546	11,200	5,316	5,077	21,592
	<hr/> ----- <u>Percent</u> -----							
Percent change,								
1960-64 -----	33	22	16	24	40	28	32	35
	<hr/> ----- <u>Dol.</u> -----							
Per capita deposits:								
1950 -----	468	430	618	507	838	835	874	845
1960 -----	785	776	957	839	1,120	1,137	1,307	1,165
1964 -----	1,010	977	1,084	1,028	1,485	1,356	1,633	1,482
	<hr/> ----- <u>Percent</u> -----							
Percent change,								
1960-64 -----	29	26	13	23	33	19	25	27

Source: 1960 County Data Book (81), and Board of Governors of the Federal Reserve System (13).

Roads

The public road system is generally financed by a combination of local, State, and Federal funds, mainly through gasoline and license taxes. Plentiful and good roads are a vital link for economic development.

By 1965, the Southern Region had double the total road mileage of the Northern Region (table 32). The density of road mileage can be expressed in terms of road mileage per 100 square miles. The SR had 110 miles of road per 100 square miles of land area compared with 74 miles in the Northern Region. Michigan had more total miles of road and miles per 100 square miles of land area than either Wisconsin or Minnesota.

The adequacy of the road network in relation to population can be expressed in terms of population per mile of road. The population in 1965 varied from 25 persons per mile in the NR to 121 in the SR. Northern Michigan had 17 people per mile of roads compared with 161 people per mile in Southern Wisconsin.

Table 32.--Selected road data, Northern and Southern Lake States Regions,
January 1, 1965

Item	Northern Region				Southern Region			
	Mich.	Wis.	Minn.	Total	Mich.	Wis.	Minn.	Total
<u>Miles</u>								
Miles of road:								
State roads --	4,155	2,520	3,078	9,753	5,093	9,217	8,915	23,225
County roads--	37,219	3,580	10,377	51,176	50,123	15,136	32,043	97,302
Total ----	41,374	6,100	13,455	60,929	55,216	24,353	40,958	120,527
Miles of road :								
per 100 square:								
miles of land :								
area:								
State roads --	13	14	10	12	21	25	18	21
County roads--	113	19	34	62	207	42	65	89
All roads ---	126	33	44	74	228	67	83	110
<u>Persons</u>								
Population per :								
mile of road:								
State roads --	173	117	160	154	1,481	425	349	627
County roads :	19	82	47	29	150	259	97	150
All roads ---	17	48	37	25	137	161	76	121

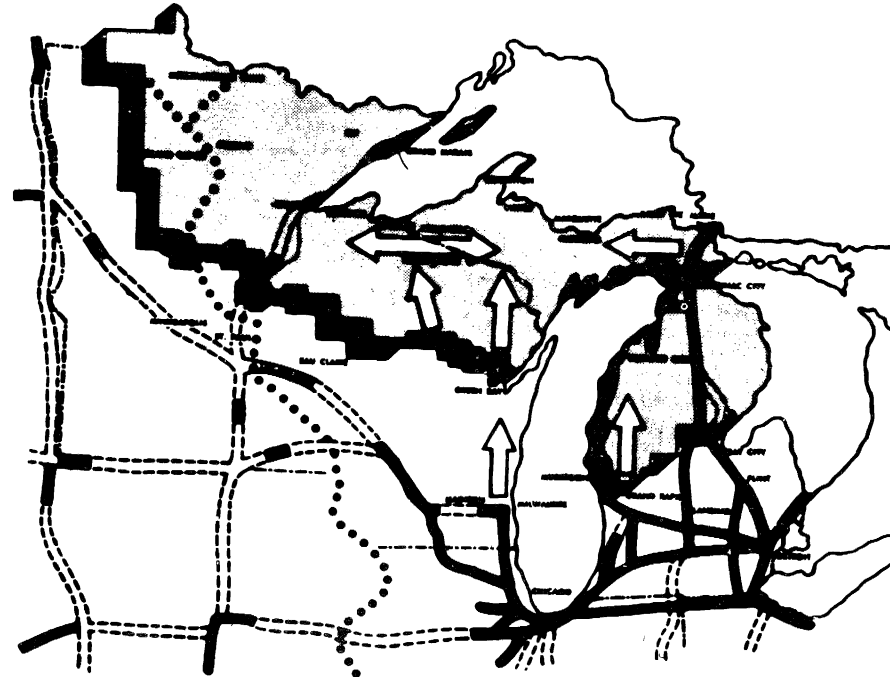
Source: Road mileage based on data from Michigan State Highway Department (30), State Highway Commission of Wisconsin (103), and Minnesota Department of Highways (unpublished). Data on area square miles from 1960 County Data Book (81).

With the exception of southern Minnesota, there were fewer people per mile of road in Michigan than in the other Lake States.

The interstate highway network facilitates travel throughout the United States. However, Michigan has completed more interstate and other limited access expressways than the other Lake States. Michigan has both east-west and north-south expressways crossing the lower peninsula. The east-west route across Wisconsin is progressing rapidly. The proposed north-south expressways in Minnesota and Wisconsin will increase the accessibility to the western portion of the Northern Region.

A U.S. Department of Agriculture Task Force (63) reported that the NR needs at least three major expressways (fig. 19): (1) A limited access east-west highway across the Northern Region; (2) a north-south expressway along the western shore of Michigan; and (3) a north-south route along the eastern shore of Wisconsin. These added systems would facilitate travel from the population centers of the southern Great Lakes hinterland into the Northern Region.

LIMITED ACCESS EXPRESSWAY NEEDS, NORTHERN GREAT LAKES REGION



SOURCE:
RESOURCES AND RECREATION IN THE
NORTHERN GREAT LAKES REGION,
U.S. DEPARTMENT OF AGRICULTURE
TASK FORCE REPORT.

- Interstate and Other Limited Access Expressways Completed.
- Interstate Expressways Proposed.
-** Mississippi River Parkway Proposed.
- ➡** Express-Type Highways Needed (General Areas To Be Served)

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Figure 19

Waterways

The Great Lakes hinterland includes a large land area of the North Central United States marking equidistance between tidewater and Great Lakes ports. If the cost of transporting goods to seagoing vessels is a function of distance only, then goods from within the hinterland would have a cost advantage in flowing to Great Lakes ports.

The St. Lawrence Seaway was opened for ocean vessels in 1959. Shipments increased from approximately 20 million tons in 1959 to over 42 million tons in 1965. In spite of the increased shipping, the seaway has not had the anticipated impact on the economy of the hinterland.

Of the many publications available on the Seaway and its relationship to the Great Lakes hinterland, two particularly useful ones are a special Senate Subcommittee study (60) and the Proceedings of the Institute on the St. Lawrence Seaway (15). To focus on the potentials and problems of the St. Lawrence Seaway as they relate to the economic development of the Lake States, selected excerpts follow:

"... the continued growth of the seaway will help reduce the number of unemployed in this region by directly offering port-oriented jobs or through the expansion of trade."

There is:

"a substantial lack of midcontinental response to the economy of seaway shipping due to ingrained shipping customs."

"The seaway, by providing an inexpensive route for the import of iron ore from Labrador, has provided a vital service to the region. Actually, it slowed the movement of steel mills from the Great Lakes region to Coastal points where steel can be imported directly from foreign sources. If this trend had continued, it would have worked overwhelming hardships on this vital section of our Nation. In the future, our Nation will be importing more and more of the raw materials needed by our industries. The seaway offers the Midwest an opportunity to receive these raw materials at a low cost that allows maintenance of industry in this area. This one fact only, the use of the seaway to import iron ore and other raw materials, more than qualifies the seaway to be hailed as a vital and necessary addition to our economic lifeline."

"Granted that the importation of Canadian ore has adversely affected the Minnesota iron ore industry, the question remains as to what would have happened in the absence of the seaway. The Labrador ore fields are relatively new, and their cost structure is not established. In recent years, however, there has been a shift at east coast, gulf and west coast steel centers to the utilization of more foreign ore relative to domestic ore. The important source being chiefly Venezuela. While it can be argued that the upper Midwest ore fields lost some of their competitiveness in the short run as a result of the opening of the Labrador mines, it is also true that new steel plants were opening in

other parts of the country near the coasts in order to be able to utilize cheaper foreign ores, and had the St. Lawrence not made Labrador ore cheaper to the Midwest region, this shift in location would have been even faster than it has in fact been."

"The economic potentials of the seaway derive not only from the economies of the ocean vessel and the types of international connections it makes possible but also from the economic potentials of the interior region it serves. The economic potentials and requirements of the region are by far the most impressive."

"Expansion of midcontinent exports by the seaway will require --

1. More equitable inland rates and equality of carrier services and transit privileges for lake port gateways with the east and gulf ports on all components of mid-continent export-import traffic.
2. More frequent, regular, and reliable ocean services to the lake ports (especially by U.S.-flag carriers) available at rates equitably adjusted to those available through competitive gateways.
3. Closer awareness and scrutiny by governmental agencies charged with acquisition and routing of international traffic of the economies and services available by the lake ports and the seaway.
4. More authority and action on the part of agencies charged with the development of the seaway to aid in the commercial development of the region."

"In the years ahead -- expect the seaway to have even greater impact on the economy of the Midwest as our industries learn to use it to best advantage. As the TVA helped the South, the seaway will help the Midwest."

BUSINESS AND INDUSTRY

This section compares the general business and manufacturing industries of the Northern and Southern Regions. The focus is on levels of activity, rates of change, and comparative advantage as indicated by changes in employment.

Retail Sales

The value of retail sales is a measure of the market value of goods sold to the consumer. Comparison of rates of population growth indicates a greater change in total retail sales in the Southern than in the Northern Region. From 1948 to 1963 retail sales increased about 50 percent in the NR and 72 percent in the SR (table 33). From 1958 to 1963 the corresponding changes were 11 and 20 percent. In 1963, total retail sales in the NR were about \$1,761 million,

Table 33.--Total and per capita value of retail and wholesale sales, Northern and Southern Lake States Regions, 1948, 1958, and 1963

Item and year	Value of retail sales		Value of wholesale sales	
	Northern Region	Southern Region	Northern Region	Southern Region
	<u>Mil. dol.</u>			
Total sales:				
1948 -----	1,171	10,926	821	13,719
1958 -----	1,585	15,744	988	21,686
1963 -----	1,761	18,831	1,301	27,609
	<u>Pct.</u>			
Change, 1958-63 -----	11	20	32	27
	<u>Dol.</u>			
Per capita sales:				
1948 -----	815	962	571	1,208
1958 -----	1,070	1,148	667	1,582
1963 -----	1,172	1,292	866	1,895
	<u>Pct.</u>			
Change, 1958-63 -----	10	12	30	20

Source: U.S. Census of Business, 1948, 1958, and 1963 (74). Per capita data based on population as of 1950, 1960, and 1964 (est.). See table 2 for 1964 estimate of population.

less than one-tenth the \$18,831 million in the SR. These increases in retail sales between 1958 and 1963 in the Northern and Southern Regions were greater than the increases in per capita retail sales (10 and 12 percent), because population increased more in the SR.

Retail sales per capita were greater in the SR than in the NR for 1948, 1958, and 1963. In 1963, they averaged \$1,172 in the NR, compared with \$1,292 in the SR. The difference was slightly less in 1958, with \$1,070 and \$1,148 for the NR and SR, respectively. These differences in level of per capita retail sales are small, and could easily be related to price level differences rather than differences in volume of consumption per capita.

Wholesale Sales

The value of wholesale sales combines the value of goods sold outside the area and those sold to retailers in the area. The total value of wholesale sales increased about 58 percent between 1948 and 1963 in the Northern Region, and slightly over 100 percent for the Southern Region. However, the increase of about \$300 million from 1958 to 1963 in the NR was a larger percentage

change (32 percent) than the increase of about \$6,000 million, or 27 percent, for the Southern Region.

The value of wholesale sales per capita in 1963 was nearly 2 1/2 times greater in the SR than in the NR (table 33). Furthermore, the difference of \$637 in 1948 increased to \$1,029 by 1963 and appears to be increasing.

Manufacturing Employment

Employment in manufacturing between 1947 and 1963, as illustrated by the index of employment, has been irregular in the Lake States (fig. 20). Between 1947 and 1955, manufacturing employment in the Lake States followed the U.S. pattern closely. But since 1955, changes in manufacturing employment have been below the U.S. level. This is consistent with data in Section IV, indicating that between 1950 and 1960 employment in manufacturing increased at a lower rate in the Lake States than in the Nation. 18/

18/ See appendix table 78 for percentage distribution of manufacturing employment in 1950 and 1960.

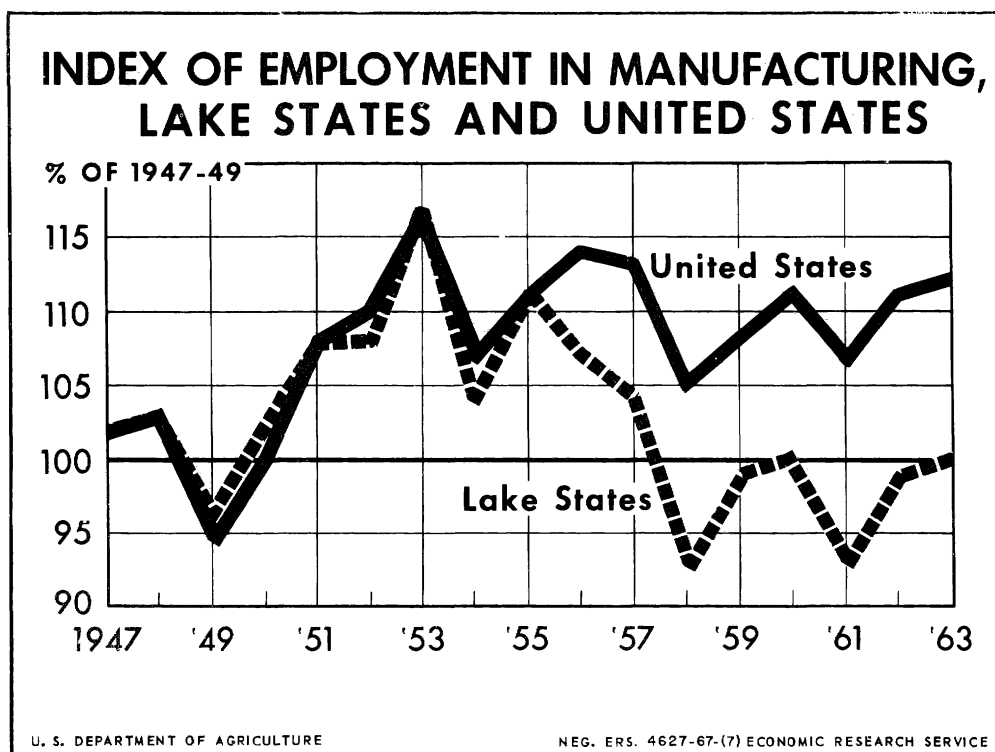


Figure 20

Wages in Manufacturing

Average weekly earnings in manufacturing are available only as annual averages by States and for the United States. Average weekly earnings in manufacturing doubled between 1947 and 1963 for the United States, increasing from approximately \$49 to \$100. The increase has been slightly above the national increase in Wisconsin and Minnesota, and much greater in Michigan, where earnings increased 125 percent over this 17-year period. The level of earnings is higher in the Lake States, especially in Michigan, than in the United States.

This difference in the weekly earnings in manufacturing could result from differences in hourly earnings, number of hours worked, or both. Most of the difference between the Lake States and the United States is due to a higher hourly rate in the Lake States, which is both advantageous and disadvantageous to the region. It indicates more productive labor, but it is a reason firms have chosen to move from the area. A thorough analysis indicates that the differential, and its effects, is more complex than either of these statements imply.

Value Added in Manufacturing

Value added in manufacturing permits comparisons of the two Lake States regions. Between 1958 and 1963 it is estimated that value added in manufacturing increased slightly more rapidly in the Southern Region (47 percent) than in the Northern (43 percent) (table 34). But the absolute increase was \$240 million in the NR compared with nearly \$7 billion in the SR.

Differences in value added per employee in manufacturing might be caused by (1) differences in efficiency, or (2) differences in the basic manufacturing process with its combination of labor and nonlabor costs. Value added per employee in manufacturing from 1958 to 1963 was greater in the SR, increasing from about \$10,000 to \$12,775, compared with an increase from \$7,500 to \$10,345 in the NR.

Value added in manufacturing per capita reflects the relative importance of manufacturing in different areas or regions. In the SR the value added in manufacturing per capita (\$1,398) for 1963 was nearly three times that in the NR (\$532). However, the increase in manufacturing per capita between 1958 and 1963 was slightly greater for the NR (41 percent) than the SR (39 percent), even though the absolute increase was greater in the SR. Value added through manufacturing is becoming increasingly important in the economic livelihood of the NR population.

There was wide variation among counties in the percentage change between 1947 and 1958 in value added in manufacturing per capita. In 13 percent of the northern counties, per capita value added decreased, compared with only 6 percent of the southern counties. However, from 1947 to 1958, 21 percent of the northern counties had an increase of 200 percent or more, compared with 14 percent of the southern counties (table 35). These data indicate greater geographic concentration of manufacturing within the northern counties.

Table 34.--Value added in manufacturing, total, per employee, and per capita, Northern and Southern Lake States Regions, 1947, 1958, and 1963

Item and year	Northern Region	Southern Region
	<u>Mil. dol.</u>	
Total value added:		
1947 -----	318	8,161
1958 -----	559	13,814
1963 <u>1/</u> -----	800	20,375
	<u>Pct.</u>	
Change, 1958-63 -----	43	47
	<u>Dol.</u>	
Value added per employee:		
1947 -----	4,334	5,453
1958 -----	7,499	10,062
1963 <u>1/</u> -----	10,345	12,775
	<u>Pct.</u>	
Change, 1958-63 -----	38	27
	<u>Dol.</u>	
Value added per capita <u>2/</u> :		
1947 -----	222	719
1958 -----	378	1,008
1963 <u>1/</u> -----	532	1,398
	<u>Pct.</u>	
Change, 1958-63 -----	41	39

1/ Preliminary estimate based on 1963 Census of Manufactures.

2/ The value added per capita figures are based on 1950, 1960, and 1964 populations of Lake States.

Source: 1947, 1958, and 1963 Census of Manufactures (77).

Table 35.--Percentage distribution of counties according to percentage change in county per capita value added by manufacturing, Northern and Southern Lake States Regions, 1947-58 1/

Percentage change in county per : capita value added by manu- : facturing, 1947 to 1958 :	Northern : Region :	Southern : Region :
	<u>Percent</u>	
Minus -----:	13	6
1 to 49 -----:	19	31
50 to 99 -----:	27	27
100 to 199 -----:	20	22
200 and greater -----:	21	14
Total -----:	100	100

1/ Excludes 17 counties for which data are not available.

Source: County and City Data Book, 1952 and 1962 (81).

Changes in Employment in Manufacturing

In 1950 and 1960 the furniture, lumber, and wood products industry was the major manufacturing industry in the Northern Region (table 36). Even so, this industry had over 7,000 fewer employees in 1960 than in 1950. Some of the manufacturing industries expanded employment, e.g., machinery, fabricated metals, and electrical equipment.

In the Southern Region there was less change in the ranking of manufacturing industries from 1950 to 1960. Motor vehicles ranked first in number of jobs in both years. But there were over 80,000 fewer employees in 1960 than in 1950.

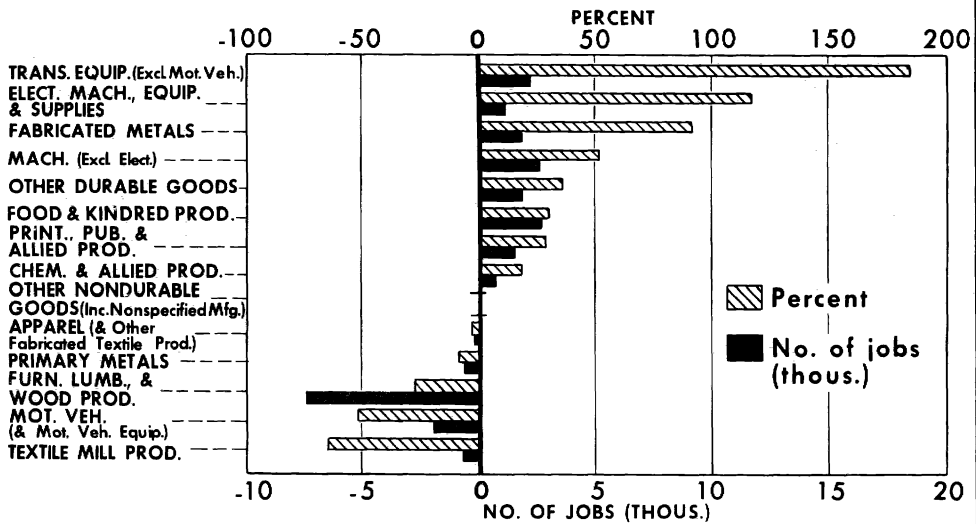
In the Northern Region between 1950 and 1960 the food and kindred products manufacturing industry had the largest gain in number of manufacturing jobs (fig. 21). The machinery and transportation equipment manufacturing industries each added nearly as many employees. These three industries added about 7,500 jobs, which offset the loss in the wood-based manufacturing industry. The manufacturing industries of transportation equipment, electrical machinery, and fabricated metals all had substantial absolute and percentage gains in employment during the 1950's.

In the Southern Region, employment increases were greatest in machinery, fabricated metals, and electrical industries (fig. 22); they added nearly 140,000 jobs between 1950 and 1960. The major decrease in employment was in the motor vehicles industry, a decline of nearly 82,000 jobs. But change in number of jobs is a single indicator of the growth or decline of an industry. Automation is the cause of decline of employment in the motor vehicles industry and not a decline in the economic importance of the industry.

By Manufacturing Industry

CHANGES IN EMPLOYMENT, 1950-60

Northern Lake States Region



SOURCE: U.S. CENSUS OF POPULATION, 1950 AND 1960

U.S. DEPARTMENT OF AGRICULTURE

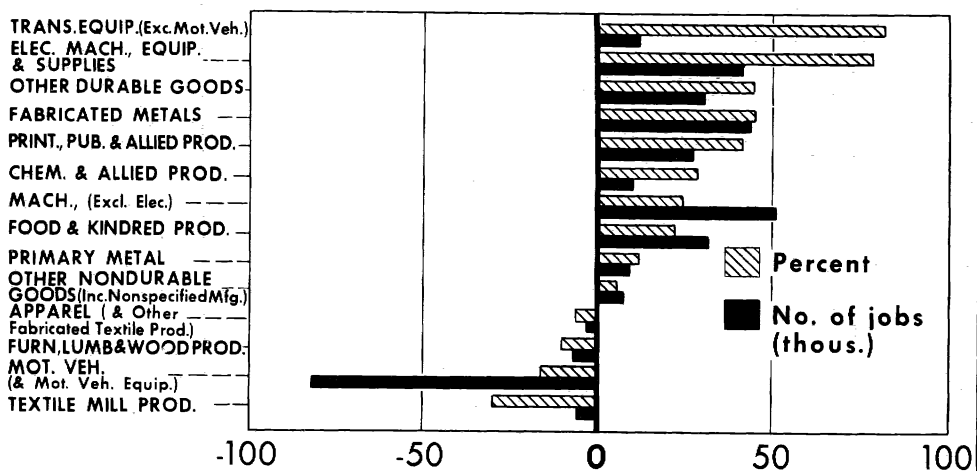
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Figure 21

By Manufacturing Industry

CHANGES IN EMPLOYMENT, 1950-60

Southern Lake States Region



SOURCE: U.S. CENSUS OF POPULATION 1950 AND 1960

U.S. DEPARTMENT OF AGRICULTURE

NEG. ERS. 4629-67-(7) ECONOMIC RESEARCH SERVICE

Figure 22

Table 36.--Percentage distribution of employed persons in the civilian labor force, by manufacturing industry, Northern and Southern Lake States Regions, and United States, 1950 and 1960

1950			1960		
Rank	Manufacturing industries	Number of employees	Rank	Manufacturing industries	Number of employees
Northern Region					
1	Furniture, lumber, and wood products	26,923:	1	Furniture, lumber, and wood products	19,567
2	Other nondurable goods	17,400:	2	Other nondurable goods	17,360
3	Food and kindred products	9,210:	3	Food and kindred products	11,928
4	Primary metal	5,976:	4	Machinery (excluding electric)	7,663
5	Machinery (excluding electrical)	5,056:	5	Other durable goods	6,803
6	Other durable goods	5,007:	6	Printing, publishing, and allied products	6,078
7	Printing, publishing, and allied products	4,705:	7	Primary metal	5,529
8	Motor vehicles and motor vehicle equipment	3,770:	8	Fabricated metal	3,839
9	Apparel and other fabricated textile products	3,710:	9	Chemicals and allied products	3,721
10	Chemicals and allied products	3,143:	10	Apparel and other fabricated textile products	3,647
11	Fabricated metal	1,987:	11	Transportation equipment (excluding motor vehicles)	3,363
12	Transportation equipment (excluding motor vehicles)	1,174:	12	Electrical machinery, equipment, and supplies	2,088
13	Textile mill products	1,104:	13	Motor vehicles and motor vehicle equipment	1,846
14	Electrical machinery, equipment, and supplies	956:	14	Textile mill products	385
Southern Region					
1	Motor vehicles and motor vehicle equipment	504,805:	1	Motor vehicles and motor vehicle equipment	423,057
2	Machinery (excluding electrical)	205,366:	2	Machinery (excluding electrical)	257,263
3	Food and kindred products	139,055:	3	Food and kindred products	171,623
4	Other nondurable goods	115,094:	4	Fabricated metal	142,182
5	Fabricated metal	97,996:	5	Other nondurable goods	122,382
6	Primary metal	86,012:	6	Other durable goods	99,560
7	Other durable goods	68,456:	7	Primary metal	96,411
8	Printing, publishing, and allied products	66,361:	8	Electrical machinery, equipment, and supplies	94,479
9	Furniture, lumber, and wood products	59,469:	9	Printing, publishing, and allied products	94,372
10	Electrical machinery, equipment, and supplies	52,395:	10	Furniture, lumber, and wood products	53,574
11	Chemicals and allied products	39,403:	11	Chemicals and allied products	50,819
12	Apparel and other fabricated textile products	22,972:	12	Transportation equipment (excluding motor vehicles)	26,067
13	Textile mill products	18,113:	13	Apparel and other fabricated textile products	21,574
14	Transportation equipment (excluding motor vehicles)	14,242:	14	Textile mill products	12,717

Source: U.S. Census of Population, 1950 and 1960 (79).

Figure 23 compares changes in regional employment with U.S. employment from 1950 to 1960. The other durable goods industry gained nearly 17,000 jobs in the Southern Region relative to employment in this industry on a U.S. basis. Likewise, the machinery, primary metals, and printing industries in the Southern Region showed substantial relative gains. Relative losses in jobs were primarily in the motor vehicle, food, and fabricated metal industries of the Southern Region.

Employment in furniture and in lumber and wood products decreased more rapidly in the Northern Region than in the United States.

Between 1950 and 1960, there were five manufacturing industries in the Northern Region that either expanded employment more rapidly or contracted less rapidly than the same industries in the United States (relative growth industries) (table 37). These were machinery; transportation equipment; other durable goods; fabricated metals; and electrical machinery. The major industries that either expanded employment less rapidly or contracted more rapidly were furniture; lumber and wood products; motor vehicles; and the other durable goods (relative decline industries). But some industries with declining employment are increasing efficiency, not declining in overall economic importance.

Only four manufacturing industries in the Southern Region were relative growth industries: Primary metals; machinery; printing, publishing, and allied products; and other durable goods.

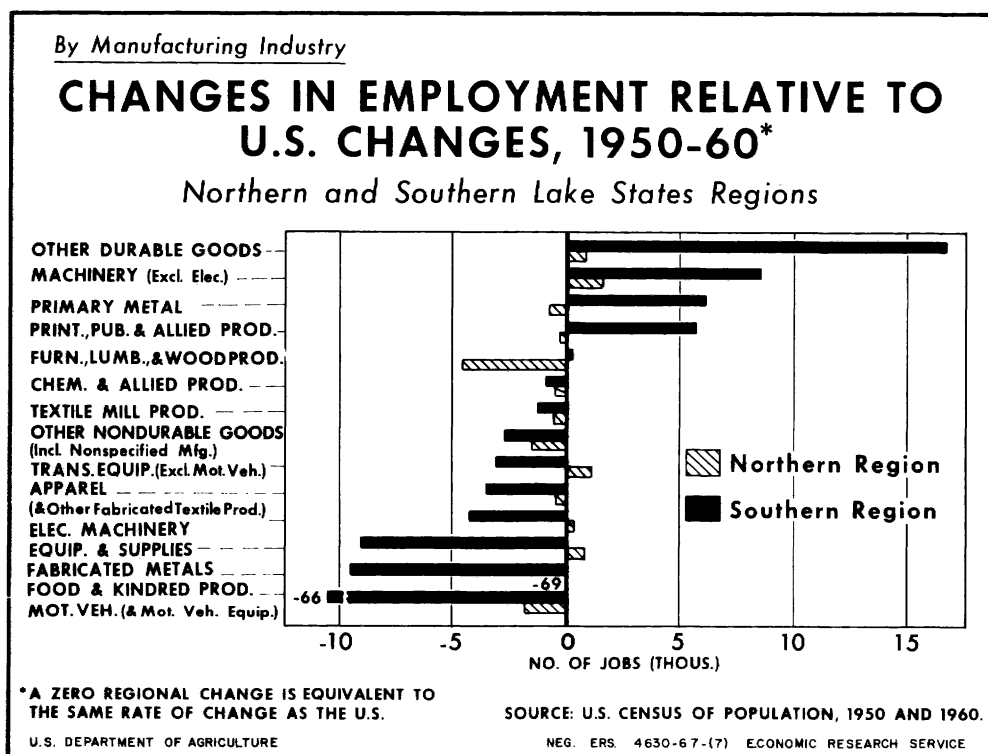


Figure 23

Table 37.--Changes in employment, Northern and Southern Lake States Regions and the United States, by manufacturing industries, 1950-60

Manufacturing industries	Change in number of employed persons			Relative change, Regions vs. United States	
	Northern	Southern	United	Northern	Southern
	Region	Region	States	Region	Region
Furniture, lumber and wood products -----	Decrease	Decrease	Decrease	<u>1</u> /Decline	<u>1</u> /Growth
Primary metal -----	Decrease	Increase	Increase	Decline	Growth
Fabricated metal -----	Increase	Increase	Increase	Growth	Decline
Machinery (excluding electrical) -----	Increase	Increase	Increase	Growth	Growth
Electrical machinery, equipment, and supplies	Increase	Increase	Increase	Growth	Decline
Motor vehicles and motor vehicle equipment -----	Decrease	Decrease	Decrease	Decline	Decline
Transportation equipment (excluding motor vehicles) -----	Increase	Increase	Increase	Growth	Decline
Other durable goods -----	Increase	Increase	Increase	Growth	Growth
Food and kindred products	Increase	Increase	Increase	Same as U.S.	Decline
Textile mill products ---	Decrease	Decrease	Decrease	Decline	Decline
Apparel and other fabricated textile products --	Decrease	Decrease	Increase	Decline	Decline
Printing, publishing, and allied products -----	Increase	Increase	Increase	Decline	Growth
Chemicals and allied products -----	Increase	Increase	Increase	Decline	Decline
Other nondurable goods --	Decrease	Increase	Increase	Decline	Decline
All manufacturing -----	Increase	Increase	Increase	Decline	Decline

1/ Decline means that the region increased less or decreased more relative to United States.

Source: U.S. Census of Population, 1950 and 1960 (79).

In total, the manufacturing industry employed more people in 1960 than in 1950 in both the Northern and Southern Regions. But the number of jobs grew at a slower rate than in nationwide manufacturing.

MINING 19/

The minerals industry of the Northern Region is primarily extractive. 20/ Little value is added to the raw material within the area; rather it is exported outside the region for processing. Therefore, the economy of the minerals industry in the NR depends on conditions outside the region. The latest census of the minerals industry was in 1958.

There were substantial changes in the minerals industry of the Lake States between 1954 and 1958 (table 38). The number of establishments declined

19/ The background information for this section was prepared by Lawrence H. Bishop, Geography Department, Michigan State University.

20/ Minerals industry is a general term which refers to mining all metallic and nonmetallic minerals.

Table 38.--Selected information on minerals industries,
Lake States, 1954 and 1958

Item	Michigan		Wisconsin		Minnesota	
	1954	1958	1954	1958	1954	1958
Number of establishments	567	539	294	295	292	289
Number of establishments with 20 or more employees	94	87	38	37	84	89
Number of employees	16,431	14,326	3,985	3,736	16,995	17,178
Payroll (thousands of dollars)	76,316	73,218	17,034	17,673	75,472	97,075
Value added in mining (thousands of dollars)	149,074	158,001	37,144	31,680	290,205	311,745
Capital expenditures (thousands of dollars)	46,762	24,985	7,577	4,513	64,046	15,269
Energy used (million kw.-hr. equivalents)	3,668	4,304	695	696	2,645	7,824

Source: U.S. Census of Minerals Industries, 1954 and 1958 (78).

slightly, though primarily in Michigan. While Michigan has nearly twice as many establishments as either Wisconsin or Minnesota, by other measures the industry is larger in Minnesota. Wisconsin has only a small minerals industry.

Employment in the Minerals Industry

Between 1954 and 1958, the number of employees and the payroll of the minerals industry declined in Michigan, increased in Minnesota, and remained stable in Wisconsin. The value added in mining increased in Minnesota and Michigan, though the level of value added was twice as large in Minnesota. Capital expenditures in the minerals industry declined in all three States between 1954 and 1958, with the greatest decrease in Minnesota.

Employment in mining has declined in the United States since 1947. While there were annual variations in mining employment in the Lake States, serious decline started in 1957. By 1963 the level of employment had declined to 83 percent of the 1947-49 average in the Lake States, but it was down to about 66 percent of this base-period average in the Nation. The pattern of decline has been more erratic in the Lake States than for the United States.

Value of Minerals Production

The value of minerals production varies annually in the Lake States. In the Northern Region the minerals output was valued at nearly \$800 million during 1957 and \$550 million in 1958 (table 39). The 1954-63 average value of minerals production in the NR was approximately \$600 million annually, more than double the output in the SR. ^{21/} Michigan had about two-thirds of the value of all minerals production for the entire Southern Region, whereas Minnesota had two-thirds of the value of the Northern Region. While there was a decline in the value of NR production after 1957, there was a small but steady increase in the value of SR output until 1963.

Iron Ore

The core of the iron ore mining industry of the United States is in the NR. The Lake Superior iron ore mining district has supplied over three-fourths of all the usable iron ore mined in the Nation since 1954 (table 40). Between 1954 and 1963 the iron ore ranges of this area averaged nearly 64 million tons of ore output annually. The eastern portion of Northern Minnesota is the major source of this mineral, averaging over 51 million tons of usable iron ore output between 1954 and 1963.

The iron ore industry is beset with problems. Prosperity in iron mining is related to the steel and iron industry. Transportation costs, production costs, and the location of the mining operation in relation to markets determine the competitive status of any ore body. In the past, high-grade ores in

^{21/} The value of production in 1963 of principal minerals for each county in the NR is shown in appendix table 79.

Table 39.--Value of minerals production, Northern and Southern Lake States Regions, 1954-63

Year	Northern Region				Southern Region			
	Mich.	Wis.	Minn.	Total	Mich.	Wis.	Minn.	Total
	<u>Thous. dol.</u>							
1954	167,729	2,038	327,977	497,744	112,211	52,248	23,497	187,956
1955	199,211	762	475,900	675,873	164,576	65,051	25,251	254,878
1956	217,890	898	475,928	694,716	176,666	64,962	25,099	266,727
1957	226,834	1,011	556,204	784,049	177,839	67,633	27,834	273,306
1958	177,950	1,432	364,568	543,950	165,537	69,902	31,312	266,751
1959	182,879	1,200	314,846	498,925	198,418	70,759	32,332	301,509
1960	215,758	1,339	479,876	696,973	213,979	75,832	35,379	325,190
1961	186,701	1,099	414,647	602,447	263,951	72,412	36,267	372,630
1962	175,063	1,519	394,581	571,163	271,449	66,770	34,355	372,574
1963	91,368	1,568	417,403	510,339	200,664	66,758	36,140	303,562
1954-63 average	184,138	1,287	422,193	607,618	194,529	67,233	30,747	292,508
	<u>Percent</u>							
1963 as percent of								
1954-63 average	50	122	99	84	103	99	118	104

Source: U.S. Department of the Interior (87).

Table 40.--Production of usable iron ore in Lake Superior District,
Northern Lake States Region, 1954-63 1/

Year	Northern Region				Regional total as percentage of U.S. production
	Mich.	Wis.	Minn.	Total	
	Thous. long tons				Percent
1954 -----	10,751	1,491	48,594	60,836	79
1955 -----	12,311	1,589	69,086	82,985	82
1956 -----	13,043	1,551	62,873	77,468	80
1957 -----	13,626	1,618	67,904	83,149	79
1958 -----	8,404	1,152	41,980	51,536	77
1959 -----	7,129	944	35,301	43,374	74
1960 -----	12,866	1,484	56,968	71,318	82
1961 -----	8,364	1,129	43,223	52,717	75
1962 -----	9,259	1,081	44,853	55,194	77
1963 -----	10,336	413	44,850	55,599	76
1954-63 average ---	10,609	1,245	51,563	63,418	--
	Percent				
1963 as percent of :					
1954-63 average ---	97	33	87	88	--

1/ Lake Superior District includes the Marquette, Menominee, Gogebic, Vermilion, Mesabi, and Cuyuna ranges.

Source: Unpublished worksheets, U.S. Department of the Interior, Bureau of Mines, Mining Research Center, Minneapolis, Minn., and Minerals Yearbook (87).

the NR could be shipped directly to the consumer with little or no processing. However, the iron content of the ores now mined is lower, while the competitive position of good quality foreign ores has strengthened. Higher costs of production and demand for higher quality have applied economic pressures to the domestic iron ore mining industry. Therefore, the industry is in a transition period from an oligopoly to a more competitive position. The future of the iron ore industry in the NR depends on the efficient and economic use of lower grade iron ores to remain competitive with foreign ores. Cost and quality relationships will be all important in the industry. Improved mining techniques, better process for enriching ore, and more efficient transportation will be vital factors in iron mining operations. 22/ Of course, demand for iron ore depends on expansion of the national economy, rising standards of living, and needs of the growing population. Other factors such as geographic shifts in ore consumption could affect the industry.

22/ Low-grade iron ore in the Superior Range can now be economically processed by beneficiation and agglomeration to increase the iron content of the raw ore before shipment. In this "enriching" process most of the waste rock is eliminated, leaving a high iron content ore which is pelleted for shipment. The pellets are of a uniform quality and can be loaded and unloaded in cold weather.

The iron ore deposits are located near the water transportation facilities on the Great Lakes. In 1964 it was estimated that 85 percent of the North American iron and steel producers could receive iron ore from the NR by lake shipping. However, high-grade foreign ores delivered by low-cost, efficient ocean transports threaten the advantage domestic producers enjoy.

There have been changes in the types of ore shipped and the areas mined. Recently there has been a decrease in production of direct shipping ores and increased production of concentrated ores. The increasing demand for ore of better quality and structure has added emphasis to pelletizing and other forms of agglomeration. There also have been shifts in regions mined. As the higher grade ores were depleted, the lower grade ores became more important. In some areas, lower grade ores were not economic and production was discontinued. In Michigan, production is shifting from the Gogebic iron range to the eastern part of the iron-producing area. In Minnesota the production from the Cuyuna iron range has declined in recent years.

In Michigan most of the ores have come from underground mines. Although some underground mining has been done in Minnesota, most of the ore comes from open-pit mines. Open-pit mining in the Mesabi iron range is less costly than underground operations, making the underground operations less competitive. Some of the underground ores with more desirable characteristics could compete with the Mesabi open pit ores. Some underground ores are now being pelletized, giving a more uniform, higher quality product that is more competitive with the open-pit ores.

With increased demand and the dwindling supply of high grade ores, less desirable iron-bearing rocks such as taconite -- a hard, complex iron-bearing rock -- are being used. Taconite comprises the bulk of the Mesabi iron range. Improvement of the beneficiation process opened the way for use of the taconite rock. Taconite ores from the open pit mines of Minnesota are likely to be used extensively (56). Several taconite processing plants have already been installed.

Estimates of iron ore reserves vary, but the quantity of low-grade ores in the Lake Superior Region is far larger than the ore mined to date. Reserves may not be the best grade, in the most ideal location with respect to transportation, or exist under good geologic conditions for extraction, but they are a significant iron ore resource for the future. Open-pit-type ore bodies will likely be exploited before the underground reserves.

The major iron ore reserves are located in Minnesota, with smaller deposits in the Michigan Upper Peninsula and a still smaller deposit in Wisconsin. The Cuyuna iron range in Minnesota is the principal producer of manganiferous iron ore in the United States. Although these deposits are not high grade (more than 45 percent) but in the 3- to 10-percent range, this range is one of the large reserves of manganiferous iron in the United States.

The NR has reserves of iron ore for several decades at present levels of demand for high-grade iron ore.

State taxation of the iron ore mining industry has hampered expansion and discouraged investments. However, recent, more liberal legislation has helped

to stimulate investments for pelletizing plants to use the taconite ores. In 1963, Michigan started a specific tax in lieu of ad valorem taxation and stimulated expansion of pelletizing facilities, which then had a tax advantage. An amendment to the Minnesota Constitution in 1964 guaranteed the taconite industry certain taxation limitations for 25 years and stimulated immediate investments to construct plants to utilize the abundant taconite ores in Minnesota (48).

Copper

All the copper produced in the Lake States is extracted in three counties of the western Michigan Upper Peninsula. For many decades Michigan was a leading copper producing State, but in 1963 it only ranked sixth. The deep underground mines had high operating costs and did not compete well with the open pit mines in Western States (28).

Copper mined in Michigan is obtained from native copper deposits, copper sulphide ores, and tailings from older operations. Output varied between 50,000 and 60,000 short tons per year from 1954 to 1960 (table 41). Then output increased to over 75,000 tons in 1963. The number of copper mines and tailing operations has remained constant during the past decade.

Further copper output will likely be confined to the western portion of Michigan's Upper Peninsula. Additional native copper deposits may be found or other copper sulphide ores discovered that can be exploited. Known reserve ore deposits have recently doubled with the discovery by one of the region's largest producers of offset extensions of the sulphide ore body. It is estimated that this mine alone will keep production steadily increasing for a number of years.

Table 41.--Mine production of copper, in terms of recoverable metal,
Northern Michigan, 1954 to 1963

Year	Producing mines		Material treated		Copper	
	Lode	Tailing	Ore	Tailings	Amount	Value
			<u>1,000</u> <u>short tons</u>	<u>1,000</u> <u>short tons</u>	<u>1,000</u> <u>short tons</u>	<u>1,000</u> <u>dollars</u>
1954-58 average	12	2	5,224	1,848	50.3	33,847
1959 -----	10	3	5,667	1,940	55.3	33,954
1960 -----	9	3	5,600	2,193	56.4	36,199
1961 -----	10	3	7,110	2,122	70.2	42,147
1962 -----	9	3	7,555	1,813	74.1	45,645
1963 -----	10	3	7,211	2,226	75.3	46,361

Source: Michigan Geological Survey (27).

Limestone and Dolomite

Nearly all of the major limestone and dolomite mines are in the Lower Peninsula and Eastern Upper Peninsula of Michigan. The raw materials are also found along the western shore of Green Bay, Wis., and in other isolated areas. In much of the northern part of the study area, rock exposures are usually igneous, metamorphic, or sandstone. The Paleozoic limestones in Michigan are near the surface and can be inexpensively exploited.

Steelmaking and construction use most of the limestone and dolomite produced in Michigan. Much of the limestone and dolomite is quarried and crushed in a few large quarries near the lakes. These favorable surface deposits are conveniently located near low-cost water transportation to the steel mills, cement and lime plants, and other industrial consumers outside the NR. The water transportation facilities provided by the Great Lakes are vital to the continuing competitive position enjoyed by the industry. Open-pit mining is used now, but underground reserves are also available. The limestone and dolomite deposits will likely become more important as the high-grade limestone and dolomite deposits outside the region are exhausted. This industry in Michigan has no major economic problems, except rising costs of production, and variation in demand which is related to the steel and construction industries. The limestone and dolomite produced in Wisconsin and Minnesota are used primarily for agriculture and concrete aggregates.

Production of limestone for cement and lime is limited to a few counties in each State. The dolomites in the eastern portion of Wisconsin contain too much magnesium for the production of cement. Only St. Louis County had cement and lime production in Minnesota in 1963. Generally, Minnesota's limestone is too high in magnesium for cement manufacture. One county in Wisconsin produced lime in 1963.

Gypsum

Iosco County in the Michigan Lower Peninsula is the only county in the Region that produces gypsum, which is processed outside the region into wall-board and other items. Only small deposits have been found in Minnesota or Wisconsin. Transportation costs are important in the economics of the gypsum industry, since both the mineral and the finished products are heavy, bulky, and relatively expensive to move. The economy of the gypsum industry is almost totally based on building construction, and any new substitute for the material would adversely affect the industry. Gypsum reserves appear adequate for many years.

Sand and Gravel

Sand and gravel are produced in virtually every county in the NR. Much of the sand and gravel is used for road construction and maintenance. These items are normally produced for local markets, so the industry is closely tied to local economic conditions. Since sand and gravel are low-cost bulk items, costs of transportation are important, particularly for shipments from outlying areas to the expanding urban and industrial centers where demand for the

products is high. Therefore, until sand and gravel deposits near the areas of high demand are depleted, the industry will be restricted to local markets because of transportation costs. There likely will be a slow increase of production but the increased demands may be localized within the NR due to the wide variances in local economies and markets.

Because of the glacial debris deposited over the NR, unconsolidated deposits of sand and gravel are widely distributed. Reserves of sand and gravel are large, but individual deposits may not contain particles of the proper size and quality. Local deposits are scarce in the old glacial lake bed in northwestern Minnesota and in the highland areas of eastern Minnesota, northern Wisconsin, and the western portion of the Michigan Upper Peninsula. In Minnesota the main sand and gravel deposits are in the southern part of the NR.

Salines

Production of natural salines is confined to Manistee and Mason Counties on the west shore of the Michigan Lower Peninsula. Bromine, calcium chloride, calcium-magnesium chloride, iodine, magnesium compounds, potash, and some salt are processed from the brines. Since processing of the brines depends on demand, production will vary as needs in the chemical and meatpacking industries change. Variations in technology could drastically change the markets for any of these saline products.

The nature of the bedrock geology and presence of sedimentary strata containing these minerals indicate that the saline industry likely will be confined to the Michigan Lower Peninsula. There are other areas with favorable geologic conditions on the west shore and along the northeast shore of the Lower Peninsula. However, production conditions are better on the west shore.

Oil and Gas

Oil and gas production in the NR is confined to the Lower Peninsula of Michigan. The first gas well was discovered in 1931 and the first oil well 2 years later. Interest increased with the demand for petroleum and gas products. Nearly half of all Michigan wells are located within the NR, primarily in the southern portion of the Lower Peninsula (26). The value of the products is large, but few persons are engaged in the industry.

Some oil and gas prospecting continues, although no new discoveries of significance have been made. The paucity of long-term production data for the fields limits predictions on future production. Demand for local sources of gas and oil will continue, so exploration will undoubtedly continue.

Peat

Peat, a major potential product of the NR, is particularly widespread in Minnesota with smaller deposits elsewhere. Minnesota has half of the U.S. reserves (43, 44, and 49). Peat has been utilized only by a few small localized operations supplying limited markets for soil conditioning and horticultural specialty applications. There are no large local markets in the region.

Research in Minnesota to determine the extent and types of peat available indicates a few economic deposits of sphagnum peat moss which could be utilized for export from the study area. However, problems of drainage of the bogs, short drying seasons, accessibility to the bog areas, and high capital investment requirements have limited peat production.

Peat is low in energy, and thus does not offer promise as a fuel because this country has large reserves of coal, lignite, oil, and gas. Unless other uses for peat are found, as in the chemical industry or as a substitute for coal or lignite, it is unlikely that much peat will be utilized in the near future.

Marl

Marl, or fresh water calcium carbonate, is widespread in the three States in old lakes or bogs associated with calcareous glacial debris. Marl is used as agricultural lime, but it is generally more expensive to process and less satisfactory than crushed limestone or dolomite for agricultural purposes. To be competitive, the product must be cheaper than crushed limestone or dolomite, and near the markets (53). It is expected that the marl industry will not expand except in isolated areas where agriculture is important and alternative sources of calcium are expensive. Marl has been produced in a few regions in the Michigan Lower Peninsula and southern Minnesota. Geologically, these areas are more favorable for the occurrence of marl than elsewhere in the NR.

Clay and Shale

Clay and shale are used primarily to manufacture cement. Production in the NR is confined to a few counties in the Michigan Lower Peninsula where the major cement plants are located, and to one county in Minnesota (38 and 39). Increased utilization of clay and shale outside the cement industry is unlikely. Since transportation costs of the raw materials are high, there is no competition with distant markets.

Various rock materials, in addition to limestone and dolomite, are produced in the NR for use as road stone, building stone, railroad ballast, and concrete aggregate. Granite, quartzite, basalt, rhyolite, marble, and sandstone rocks are included. Production is confined to a few counties in the central portion of the NR where these materials are available near the surface. Transportation costs are too high to ship these materials to distant markets.

OUTDOOR RECREATION 23/

Population growth will continue and tomorrow's citizens will have higher per capita disposable income and more leisure time. There will be an unprecedented increase in demand for outdoor recreation. Nature furnishes an abundance of raw materials for outdoor recreation: Scenery, water, mountains, and climate. These natural resources, however, need the man-created ingredients of accessibility and services.

The NR has been a woods and waters vacationland for several generations. The first visitors were mainly hunters and fishermen from the Southern Region of the Lake States. Today, travelers come from all parts of the country in search of scenic and historical sites, swimming and boating, winter sports, and the clean fragrance of pine forests. Tourism is a major factor in the present and future economy of the NR.

Origin of Visitors

Recent surveys of vacationers in the Lake States indicate that most users of the recreation and tourism facilities of the NR come from the North Central Region of the United States and Canada. 24/ From one-fourth to one-third of the vacationers in each of the three States are residents of that State (table 42).

The majority of out-of-State visitors come from other North Central States. As limited access highways are completed and cut travel time, there will likely

23/ The background information for this section was prepared by John L. Okay, Agricultural Economics Department, Michigan State University.

24/ The North Central Region of the United States comprises Ohio, Indiana, Illinois, Michigan, Wisconsin, Missouri, Iowa, Minnesota, Kansas, Nebraska, South Dakota, and North Dakota.

Table 42.--Origin of vacationers to the Lake States

State of vacation <u>1/</u>	Same State	Other North Central States	Total North Central Region	Other (including foreign)
			<u>Percent</u>	
Michigan ---:	32	46	78	21
Minnesota --:	30	62	92	8
Wisconsin --:	26	64	91	9

1/ Michigan data are for 1957, Wisconsin for 1960, and Minnesota for 1963.

Source: Michigan State University (33), University of Wisconsin (95), and Sieleff (55).

be an increase in the proportion of vacationers from other States. However, competing vacation areas are available, so the change may be small. Vigorous promotion of the NR and improved roads and tourist accommodations may increase the drawing power of the region.

Income and Recreation

One major determinant of the economic importance of outdoor recreation in the Northern Region is the level of income of those most likely to use the facilities of the region. In 1959, disposable income per capita in the North Central States was about \$1,900 (table 43). It is estimated that by 1976 this will have increased to about \$2,900, and that disposable income per household will increase from about \$6,575 in 1959 to \$10,350 by 1976. Between 1957 and 1976, it is estimated that the proportion of families in the North Central Region with personal income above \$6,000 per year will increase from about 42 percent to 69 percent (table 44) (93).

Time and Recreation

In the North Central Region it is estimated that by 1976 the work week will average 2 hours less than in 1960 and there will be longer paid vacations (table 45). Nearly every session of Congress considers bills proposing additional national holidays, so it seems likely that by 1976 one or two more national holidays will have been added. All of these trends point toward more free time, some of which will be devoted to outdoor recreation.

Public Recreation Land

The aggregate demand for outdoor recreation in the NR will increase, but what of the aggregate supply? Data on the acreage of public recreation lands

Table 43.--Disposable income (1959 dollars) in the North Central Region, 1959 and 1976 ^{1/}

Disposable income ^{2/}	1959	Estimated 1976	Percentage increase
	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>
Per capita -----:	1,906	2,941	54
Per household -----:	6,574	10,350	57

^{1/} North Central Region includes: North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri, Wisconsin, Michigan, Illinois, Indiana, and Ohio.

^{2/} Personal income after taxes.

Source: U.S. Public Law 85-470, Table D-30 (93).

Table 44.--Personal income distribution (1959 dollars) in the North Central Region, 1957 and 1976

Personal income level <u>1/</u>	Percentage of families and individuals	
	1957	Estimated 1976
Below \$6,000 -----	58	31
6,000 and over -----	42	69

1/ Personal income includes disposable income and personal taxes.

Source: U.S. Public Law 85-470, Table D-31 (93).

Table 45.--Workweek, vacations, and holidays in the North Central Region, 1960 and 1976

Item	1960	Estimated 1976
Workweek -----	38 hours	36 hours
Paid vacation -----	2 weeks	3 weeks
Yearly holidays -----	6 days	9 days

Source: U.S. Public Law 85-470, Tables B-20, B-26 (93).

indicate nothing about accessibility or development. They do provide an estimate of the space available for recreational development. Of the nearly 256 million acres of public recreation land in the United States in 1960, about 8 percent, or 19.5 million acres, was in the Lake States; this was over two-thirds of all the public recreational land in the 12 North Central States (table 46) (93).

Of the approximately 19.5 million acres of public recreational land in the Lake States, about 91 percent (17.7 million acres) is in the Northern Region. The public recreational land is not near the large population centers it serves. Thus, a good highway system is necessary between the southern population centers and the NR to realize the recreation potential of the region.

The Outdoor Recreation Resources Review Commission (ORRRC), in a comprehensive nationwide study of recreation and tourism, concluded that designated public recreational areas are not being developed and used to the best advantage. The problem is to develop and maintain existing public lands, not to acquire new areas. Development can best be accomplished through cooperative efforts of private individuals, citizen groups, and local, State, and Federal Government units.

Table 46.--Acres and distribution of public recreational land, Lake States, North Central Region, United States, 1960

Area	Thousands of acres	Percentage of Lake States total	Percentage of North Central total	Percentage of U.S. total
Northern Region -----	17,708	91	63	7
Southern Region -----	1,800	9	6	1
Lake States total ----	19,508	--	69	8
North Central Region :	28,290	--	--	11
U.S. total -----	255,833	--	--	--

Source: Based on data from: Michigan Department of Conservation, Wisconsin Conservation Department, Minnesota Conservation Department, and U.S. Public Law 85-470 (93).

With no increase in public recreational land area, by 1976 there would still be 0.42 acre of public land per person in the 12 North Central States, a reduction of about 0.1 acre per person over 1960 (table 47). The reduction per capita in the Lake States is estimated to be somewhat greater by 1976, though still not an alarming decline.

The most highly developed and most intensively used public recreation lands are the Federal and State parks (fig. 24). There are also nearly 400 other public campsites in the NR and 70 in the SR.

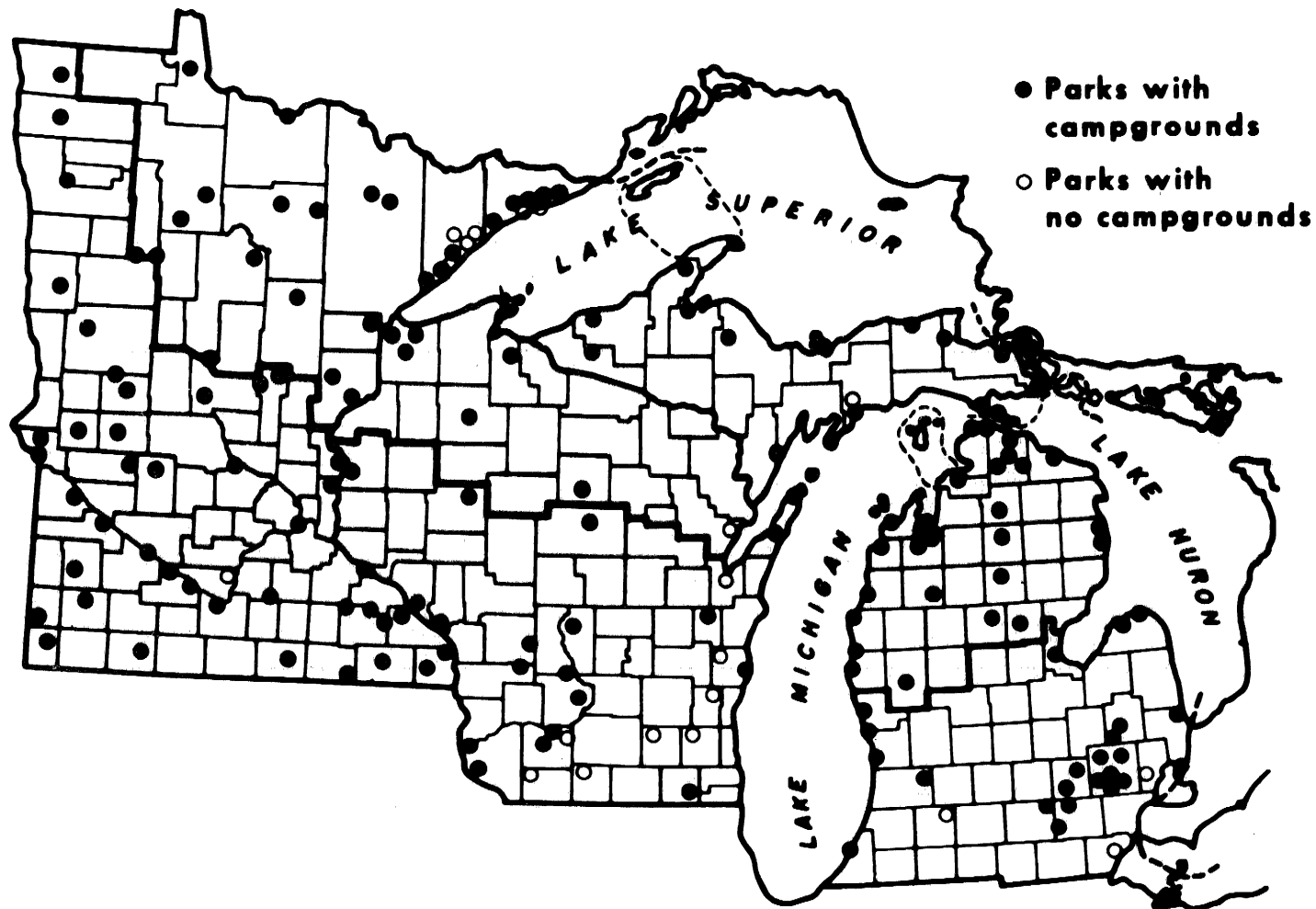
Table 47.--Public recreational land per capita, Lake States and North Central Region, 1960 and 1976

Area	Acres per capita	
	1960	Estimated 1976 ^{1/}
Michigan -----	0.89	0.60
Minnesota -----	2.22	1.76
Wisconsin -----	1.26	0.97
North Central Region -----	0.55	0.42

^{1/} Assumes no increase in acres of public recreational land from present totals.

Source: Based on data from: Michigan Department of Conservation, Minnesota Conservation Department, Wisconsin Conservation Department, ORRRC Report No. 2, pp. 59-73, and Report No. 23, table A-2 (93).

LOCATION OF STATE PARKS, 1964



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Figure 24

State Park Attendance

Attendance at State parks throughout the Lake States during 1964 was nearly 22 million persons, nearly two-thirds of whom visited Michigan State parks (table 48). Minnesota parks, however, had the largest relative increase in attendance between 1961 and 1964 (12 percent), while Wisconsin parks had a 9 percent decline in attendance. During 1964, Michigan and Minnesota State parks turned away 49,636 and 10,621 campers, respectively.

Available data do not permit comparison of attendance in the Northern and Southern Regions. But data for Michigan illustrate the attendance pattern (table 49). Nearly two-thirds of the Michigan State parks are in the NR, but have only one-third of the total attendance. The Northern Region State parks are popular for camping; they issued about two-thirds of the camp permits in 1964.

Table 48.--State park attendance in the Lake States, 1964

State	1964 attendance	Percentage change 1961-64
	<u>Number</u>	<u>Percent</u>
Michigan -----	13,844,262	3
Minnesota -----	3,098,170	12
Wisconsin -----	5,032,548	-9
Lake States total ---	21,974,980	1

Source: Based on data from Michigan Department of Conservation, Minnesota Conservation Department, Wisconsin Conservation Department (unpublished).

Table 49.--Selected data on State park attendance, Michigan, 1964

Item	Northern counties 1/	Southern counties 1/	Total
Number of State parks --	40	25	65
State park attendance:			
Number (thousands) ---	4,771	9,073	13,844
Percent -----	34	66	100
Camp permits:			
Number (thousands) ---	151	89	240
Percent -----	63	37	100

1/ Includes the counties of Michigan in the Northern and Southern Regions of the Lake States, as defined by this study.

Source: Michigan Department of Conservation (unpublished).

Hunting Licenses

Another indicator of the demand for recreation facilities is the number of hunting licenses issued. Hunting license sales to residents in the Lake States increased from 2.4 to 2.5 million (6 percent) between 1962 and 1964 (table 50). During the same period, sales to nonresidents increased about one-third, but only 30,000 nonresident licenses were sold in 1964.

Table 50.--Hunting license sales in the Lake States, 1962 and 1964

Year	Licenses sold	Percentage change 1962-64
	<u>Number</u>	<u>Percent</u>
Resident:		
1962 -----	2,365,494	6
1964 -----	2,501,797	
Nonresident:		
1962 -----	22,595	31
1964 -----	29,664	

Source: Based on data from Michigan Department of Conservation, Minnesota Conservation Department, Wisconsin Conservation Department (unpublished).

Tourist Lodging

The tourist lodging business (hotels, motels, tourist courts, and camps) is one of the activities most affected by an improved highway system. It is estimated that receipts of the tourist-lodging business in the Lake States were \$312 million in 1963, 20 percent higher than in 1958 (table 51). Lodging firms in Wisconsin averaged the greatest increase in receipts over this 5-year period (28 percent).

Table 51.--Growth of the tourist-lodging business in the Lake States, 1958-63

Area	1963 receipts	Establishments	Percentage change, 1958-63
	<u>\$1,000</u>	<u>Number</u>	<u>Receipts : Establishments</u>
Michigan -----	130,165	4,034	18 8
Minnesota -----	92,558	3,163	16 -3
Wisconsin -----	89,440	3,435	28 11
Lake States total -	312,163	10,632	20 5

Source: Census of Business (74).

There was a smaller relative increase in number of lodging businesses (5 percent) than in total receipts. Therefore, receipts per business unit were larger, as new installations and existing units grew and as fuller use was made of units. Wisconsin gained 11 percent and Michigan 8 percent, but Minnesota lost 3 percent of its lodging establishments between 1958 and 1963.

Tourist Expenditures

In Wisconsin in 1961, about one-fourth of tourist expenditures were for lodging (table 52). Another one-fourth of these expenditures were with tourist-oriented businesses, such as restaurants, amusements, films, and souvenirs; one-third were for less directly tourist-oriented items.

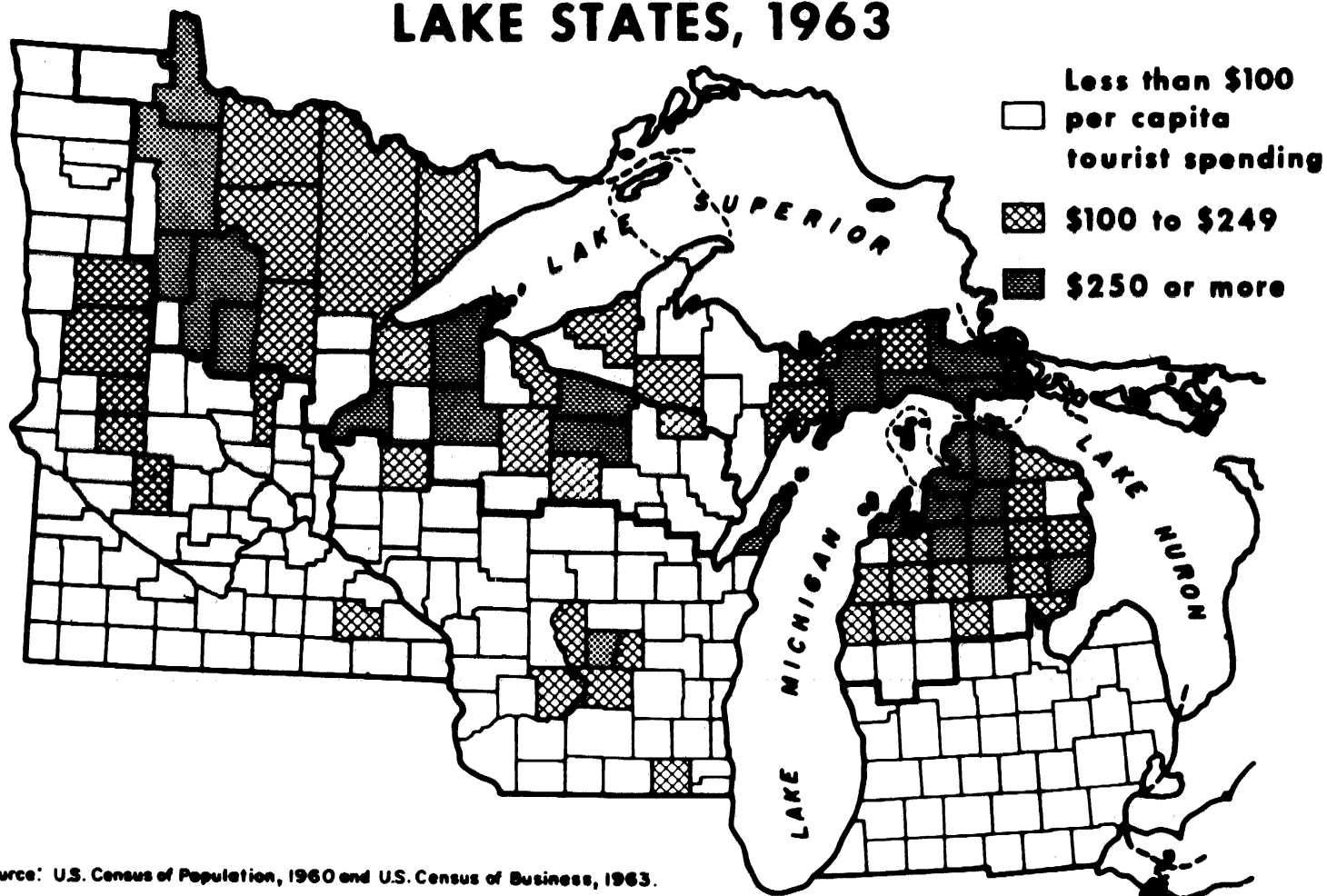
The economy of some Northern Region counties depends on tourism. Per capita tourist expenditures in 1963 in the NR were nearly \$200 compared with \$40 in the SR (table 53). In northern Wisconsin the average was over \$250. In a number of NR counties and in only one SR county, tourist expenditures in 1963 exceeded \$250 per resident (fig. 25). In a few counties the average was over \$1,000. While absolute expenditures were greater in some southern counties, there were only a few southern counties where tourist expenditures per capita exceeded \$100.

Table 52.--Percentage distribution of tourist expenditures among types of businesses, Wisconsin, 1961

Types of businesses	Percentage of tourist expenditures
Tourist oriented:	
Lodging -----	26
Restaurants -----	10
Amusements -----	7
Film, souvenirs, etc. -----	<u>5</u>
Subtotal -----	48
Nontourist oriented:	
Groceries -----	13
Transportation (including gas and oil) -----	10
Related camping, sporting, and photographic equipment -----	<u>11</u>
Subtotal -----	34
Other unclassified expenditures -----	<u>18</u>
Total -----	100

Source: Fine and Werner (14).

ESTIMATED TOURIST EXPENDITURES PER CAPITA, LAKE STATES, 1963



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Figure 25

Table 53.--Total and per capita tourist spending, Northern and Southern Lake States Regions, 1963

Area	Total tourist spending	Per capita tourist spending ^{1/}
	<u>Thousand dollars</u>	<u>Dollars</u>
Michigan:		
North -----	125,867	175
South -----	262,768	35
Minnesota:		
North -----	89,626	182
South -----	151,346	49
Wisconsin:		
North -----	74,940	255
South -----	161,896	41
Total Northern Region ---	290,433	193
Total Southern Region ---	576,010	40

^{1/} Computed from 1964 population estimates in Sales Management Magazine (7).

The importance of tourism to a community is emphasized by the percentage of total retail sales that represents tourist expenditures and services. In the NR, 15 percent of total retail sales and services in 1963 were spent by tourists, but only 3 percent in the SR (table 54).

In 1963, lodging and amusement receipts were 46 percent of receipts for all types of service businesses in the NR, but only 14 percent in the SR (table 55).

Demand for tourist facilities will continue to expand. There will be more visitors to the NR, who will stay longer, participate in a wider range of activities, and spend more money. But they will demand better facilities with the natural attractions. While the industry should grow and prosper, many businesses are likely to yield low profits. Industry advertising can attract people to the region, but an individual proprietor must bring visitors to his establishment. The region also must compete against other regions. Probably the biggest single handicap of the NR tourist industry is the short summer season. It is difficult to earn enough income for a year in a few months, so considerable effort is being made to expand winter sport attractions. Recreation businesses are no longer small, so the structure of the tourist industry will change as successful complexes of enterprises develop.

Table 54.--Importance of tourist spending, Northern and Southern
Lake States Regions, 1963

Area	Total sales and services <u>1/</u>	Tourist spending	Tourist spending as percentage of total
	<u>Thousand dollars</u>	<u>Thousand dollars</u>	<u>Percent</u>
Michigan:			
North -----	957,709	125,867	13
South -----	11,690,054	262,768	2
Minnesota:			
North -----	606,239	89,626	10
South -----	4,668,110	151,346	3
Wisconsin:			
North -----	387,106	74,940	19
South -----	5,445,355	161,896	3
Total Northern Region ---	1,951,054	290,433	15
Total Southern Region ---	21,803,519	576,010	3

1/ Retail sales plus Selected Service Receipts, 1963.

Source: Census of Business (74).

Table 55.--Tourist-oriented services, Northern and Southern
Lake States Regions, 1963

Area	Selected service receipts	Lodging and recreation receipts <u>1/</u>	Receipts of tourist- oriented services as percentage of total
	<u>Thous. dol.</u>	<u>Thous. dol.</u>	<u>Pct.</u>
Michigan:			
North -----	90,361	39,116	43
South -----	1,702,038	222,726	13
Minnesota:			
North -----	61,499	26,420	43
South -----	663,560	83,535	13
Wisconsin:			
North -----	37,905	21,936	58
South -----	606,965	98,664	16
Total Northern Region ---	189,765	87,472	46
Total Southern Region ---	2,972,563	404,925	14

1/ Receipts of hotels, motels, tourist courts, camps, and amusement places
except motion pictures.

Source: Census of Business (74).

AGRICULTURE

The farming potential of the Northern Region has long been controversial. Optimistic residents of this coniferous forest area visualize a farmer on every 40 acres, while pessimists suggest turning the land back to the State when the current stand of timber is harvested. Both views are extreme -- the truth lies somewhere in between (59).

Farming in this region is experiencing adjustments similar to those in the New England States a century earlier. After the virgin timber wealth was harvested, mining provided employment. The advantage of nearness to market disappeared and the small-scale farms could not compete. Areas of thin or sandy land have gone out of agricultural use, but more productive soils are still farmed. The region has the adjustment problems of agriculture generally, and must compete with more productive regions. The impact of these adjustments is more evident in the NR than in the SR. The nature of adjustment is indicated in the 1959 Census of Agriculture. The 1964 agricultural census data may reveal a somewhat different rate of change.

Land in Farms

A smaller proportion of the land area of the NR is in farms than either the SR or the United States. In 1959, only 20 percent (10.4 million acres) of the NR land area was in farms, compared with 80 percent (56.4 million acres) for the SR and 59 percent for the Nation (table 56). Furthermore, land in the Northern Region was being removed from farm use at a more rapid rate. Only 9 of every 100 acres in the Northern Region was used as cropland in 1959; in the Southern Region, 56 of every 100 acres; and for the United States, about one-fourth of the total land area was cropland.

These proportions of cropland were slightly greater in 1959 than in 1949 for both regions. In the Northern Region only 45 percent of the farmland was cropped in 1959, compared with 70 percent in the southern counties.

Size of farm is nearly the same for the two regions. From 1949 to 1959 acres per farm in the NR increased from 145 to 181 acres, slightly greater than the change of 144 to 170 acres in the SR. Farms are smaller in the Lake States than in the United States. The change in acres per farm between 1949 and 1959 was only 30 to 35 acres in the Lake States, compared with nearly 90 acres for all farms in the United States, bringing the national average to 302 acres per farm in 1959. Based on number of acres per farm, adjustment of size-increasing technology is lagging in the Lake States.

Number of Farms

The number of farms has declined more rapidly in the NR than in the SR. Number of farm operators declined 38 percent (down from 92,121 to 57,099) in the northern counties between 1949 and 1959, a greater decrease than 31 percent for the Nation (table 57). In the Southern Region, there were only 19 percent fewer farms in 1959 (331,595) than in 1949 (411,130).

Table 56.--Land in farms and cropland, Northern and Southern Lake States Regions, and United States, 1949 and 1959

Item	1949			1959		
	Northern:	Southern:	United :	Northern:	Southern:	United
	Region :	Region :	States 1/:	Region :	Region :	States 1/
	<hr/>					
	Percent					
Total land area in farms -----	26	85	61	20	80	59
Cropland as percent- age of total land : area -----	10	58	25	9	56	24
Cropland as percent- age of land in : farms -----	42	68	41	45	70	40
	<hr/>					
	Acres per farm					
Cropland, acres ----	62	99	89	82	118	121
Other land, acres --	83	45	126	99	52	181
Total, acres --	145	144	215	181	170	302

1/ Conterminous United States only.

Source: U.S. Censuses of Agriculture, 1950 and 1959 (73).

Table 57.--Number of farms, percentage of part-time farmers, and percentage of farm families with nonfarm income exceeding value of farm products sold, Northern and Southern Lake States Regions and United States, 1949 and 1959

Item	Northern Region	Southern Region	United States 1/
Number of farm operators:			
1949 -----	92,121	411,130	5,379,250
1959 -----	57,099	331,595	3,707,973
Percentage change, 1949-59 -----	-38	-19	-31
Percentage of farm operators working 100 days or more off the farm:			
1949 -----	26	18	23
1959 -----	37	25	30
Percentage of farm families with nonfarm income exceeding value of farm products sold:			
1949 -----	32	17	29
1959 -----	44	25	36

1/ Conterminous United States only.

Source: U.S. Censuses of Agriculture, 1950 and 1959 (73).

Nonfarm Jobs and Income of Farm Operators

In relatively disadvantaged farming areas, if opportunities are available, one would expect more farm operators to seek supplemental income from off-farm jobs. In the Northern Region about 1 out of 4 farmers worked off the farm 100 days or more in 1949; by 1959, this proportion had increased to over 1 out of 3 farmers. In the Southern Region, about 1 out of 6 farmers worked 100 days or more off the farm in 1949, and 1 out of 4 by 1959.

Another indication of the number of farm operators who supplement their farm earnings is the proportion of farm families with nonfarm income that exceeds the gross value of farm products sold. Income from nonfarm sources exceeded gross income from farming in 1949 on one-third of the farms in the NR (table 57). The proportion of farmers with their major source of income from off the farm in 1959 was substantially greater in the NR (44 percent) than in the SR (25 percent). In 1959, 30 percent of U.S. farm operators worked off the farm 100 days or more per year and 36 percent had nonfarm income exceeding gross farm sales. This exceeded the SR percentage, but was lower than that of the NR.

Economic Class of Farm

In the 1959 Census of Agriculture, commercial farms are categorized by economic classes (I through VI). 25/ Measures other than value of sales are

25/ The value of farm products sold for commercial farm economic classes is as follows:

Class I:	\$40,000 and over
Class II:	20,000 to 39,999
Class III:	10,000 to 19,999
Class IV:	5,000 to 9,999
Class V:	2,500 to 4,999
Class VI:	50 to 2,499*

*Provided the operator was under 65 years of age, did not work off the farm 100 days or more, and off-farm income of operator and family was less than the value of farm products sold.

Definitions of these groups differ slightly in 1949 and 1959. The lower limit of sales for commercial farms was \$250 in 1949 and \$50 in 1959. Also, to be classified as a commercial farm in 1959 the operator had to be under 65 years of age.

The definition of a farm also differed in 1949 and 1959. Lower limits of 3 acres and/or \$150 sales in 1949 were changed to 10 acres and \$50 sales or \$250 sales if less than 10 acres in 1959.

In 1949, part-time farmers had limits of \$250 to \$1,199 on value of farm sales, whereas in 1959 the limits were \$50 to \$2,499, and an age limitation of 65 years.

These definitional differences affect the number of farms in different economic classes, but the influence is assumed to be proportional for the Northern and Southern Regions.

also used to classify farms into groups. The noncommercial farm groups are: Class VII (part-time); Class VIII, (part-time retirement); and Class IX (abnormal).

In 1949, two thirds of NR farms were commercial, compared with 84 percent in the SR (table 58). The proportion of part-time farmers in the northern counties in 1949 was nearly double that in the southern counties, 15 and 8 percent, respectively. By 1959 the proportion of commercial farms had decreased and the proportion of part-time farms approximately doubled in both regions. In both 1949 and 1959 the proportion of farms in the three groups (commercial, part-time, and other) in the NR was more like the U.S. pattern than the proportion in the SR.

A large proportion of NR farms are in the low-gross-income classes. Eighty-six percent of the northern farms had farm sales under \$5,000 in 1949, compared with 57 percent of the southern farms. In 1959, 56 and 31 percent of the northern and southern farms, respectively, had sales under \$5,000 (table 58).
26/

A relatively small proportion of farms in NR were in the higher gross income classes in 1949. However, in the SR a greater proportion (44 percent) of farms in 1949 had sales of \$5,000 or more than in the Nation (32 percent). But farms in the SR did not increase gross sales as rapidly as in the United States. In 1959, 69 percent of farms in the SR and 60 percent in the United States had sales of \$5,000 or more.

Income of Farm Families

Data are not available to compare trends in net farm income between regions, but trends of net farm income for the Lake States and the United States can be compared. The index of total net farm income shows a precipitous drop from 1951 to 1955 for both the Nation and the Lake States. Since 1955 the index of net farm income has remained at about the same level with year-to-year variations.

The proportion of total U.S. net farm income produced in the Lake States remained constant for the 1949-61 period. But since 1961, the Lake States proportion has declined with (1) the lag in adjusting to larger farms, and (2) the slow decline in number of jobs in agriculture compared with the United States. Net farm income per operator is low in the Lake States compared with the Nation.

Agricultural Land Resources

The National Inventory of Soil and Water Conservation Needs (61), completed in 1958, included 84 percent of the land in the NR and 93 percent in the SR (table 59). In the NR, 70 percent was categorized in Classes I to IV (capable

26/ See appendix table 80 for number of farms by economic classes, 1949 and 1959.

Table 58.--Percentage distribution of farms, by economic class, and number of farms, Northern and Southern Lake States Regions and United States, 1949 and 1959

Item	1949			1959		
	Northern Region	Southern Region	United States	Northern Region	Southern Region	United States
	<u>Percent</u>					
All farms 1/:						
Commercial -----:	67	84	69	58	78	65
Part-time -----:	15	8	12	30	15	24
Other -----:	18	8	19	12	7	11
Total -----:	100	100	100	100	100	100
	<u>Farms</u>					
Number -----:	92,121	411,130	5,379,250	57,099	331,595	3,707,973
	<u>Percent</u>					
Commercial farms:						
Value of farm prod- ucts sold:						
\$50 to \$2,499 2/ --:	55	24	44	17	6	14
\$2,500 to \$4,999 --:	31	32	24	40	25	26
\$5,000 to \$9,999 --:	11	32	19	30	38	27
\$10,000 and greater:	3	12	13	13	31	33
Total -----:	100	100	100	100	100	100
	<u>Farms</u>					
Number -----:	61,984	347,616	3,706,412	32,842	259,212	2,416,017

1/ Farm definitions differ somewhat between 1949 and 1959. For exact definitions, see footnote 25 in the text.

2/ The lower limit of the frequency class \$50 to \$2,499 was \$250 in 1949.

Source: U.S. Censuses of Agriculture, 1950 and 1959 (73).

Table 59.--Conservation needs, inventory land capability classes, Northern and Southern Lake States Regions, 1958

Inventory classes <u>1/</u>	Northern Region				Southern Region			
	Mich.	Wis.	Minn.	Total	Mich.	Wis.	Minn.	Total
	<u>Percent</u>							
Inventory and non- inventory land as a percentage of total land area:								
Inventory land	84	85	83	84	90	93	95	93
Noninventory land	16	15	17	16	10	7	5	7
Total	100	100	100	100	100	100	100	100
	<u>1,000 acres</u>							
Acreage	20,987	11,766	19,667	52,421	15,504	23,244	31,538	70,288
	<u>Percent</u>							
Inventory classes as a percentage of total inven- tory acreage: <u>2/</u>								
Classes I-IV (cropland)	10	15	10	10	60	49	67	60
Classes I-IV (noncropland)	62	59	57	60	34	29	23	27
Classes V-VIII	28	26	33	30	6	22	10	13
Total	100	100	100	100	100	100	100	100
	<u>1,000 acres</u>							
Acreage	19,600	9,996	16,303	43,900	13,880	21,568	29,821	65,270

1/ Inventory acreage includes all land except (1) urban and built-up acres, and (2) land owned by the Federal Government other than cropland operated under lease or permit.

2/ Land in Classes I-IV was divided into cropland, which includes land currently tilled, and noncropland which includes pasture, forest and woodland, and other land. Land in capability Classes I-IV is land generally suited for cultivation and other uses. Land in Classes V-VIII is generally not suited for cultivation. For this reason the cropland and noncropland categories were combined to represent all land in Classes V-VIII.

Source: Wisconsin (unpublished worksheets, Soil Conservation Service, Madison, Wisconsin); also (32, 35, 61).

of being cultivated), compared with 87 percent in the SR, a small difference. 27/ But only 10 percent of the inventory land in the Northern Region, compared with 60 percent in the Southern Region, was cropland. The balance of the capability Classes I through IV (60 percent of the NR and 27 percent of the SR inventory land) was in noncropland uses (pasture-range, forest-woodland, and other land uses). With the short growing season in the NR, much land in capability Classes I through IV cannot be used for farming.

In the NR, Minnesota had 33 percent of its land in capability Classes V through VIII, Northern Michigan 28 percent, and Wisconsin 26 percent. On the other hand, southern Wisconsin had 22 percent of its land in capability Classes V through VIII, southern Minnesota 10 percent, and southern Michigan only 6 percent.

Investment in Land and Buildings

Investment in farmland and buildings varies by size of farm and type of farming. In 1950, 96 percent of the northern counties and 21 percent of the southern counties had less than \$10,000 investment in land and buildings per farm (table 60). In 1959, no northern counties had an average value of land and buildings over \$30,000 (only 3 percent averaged over \$20,000), while nearly half the southern counties averaged over \$30,000. A significant proportion of the change resulted from new investment in land improvements and buildings.

27/ The classes are as follows:

- I to III - Suitable for regular cultivation and a wide range of other uses.
- IV - Marginal for cultivation.
- V to VIII - Not suitable for cropland use.

Table 60.--Percentage distribution of counties by county average value of farmland and buildings per farm, Northern and Southern Lake States Regions, 1950 and 1959

County average value of farmland and buildings per farm	1950		1959	
	Northern	Southern	Northern	Southern
	Region	Region	Region	Region
	Percent			
Less than \$10,000 -----	96	21	29	--
\$10,000 to \$19,999 -----	4	63	68	26
\$20,000 to \$29,999 -----	--	14	3	29
\$30,000 to \$39,999 -----	--	2	--	21
\$40,000 and greater -----	--	--	--	24
Total -----	100	100	100	100

Source: U.S. Census of Agriculture, 1950 and 1960 (73).

While the number of acres per farm was the same in the two regions, the value of land and buildings per acre was substantially lower in the Northern Region. In 1950 all counties in the Northern Region had a value of land and buildings of less than \$100 per acre. By 1959 only half the northern counties and 80 percent of the southern counties had a value of over \$100 per acre for land and buildings (table 61).

Farm Cash Receipts

In 1949 the value of farm products sold per farm in the Southern Region (\$4,854) was more than double the Northern Region average (\$2,206). Sales per farm in the SR exceeded the national average (\$4,100), but in 1959 the national average was greater than the SR average. Sales per farm in the NR increased relatively more than in the SR (table 62).

Differences in type of farming between the two regions is reflected in the proportion of income from sales of various commodities (table 62). In 1949, 45 percent (\$91.9 million) of farm receipts came from the sale of dairy products in the NR compared with 32 percent (\$637.4 million) for the SR. About 11 percent more of the total value of farm products sold originated from other livestock and livestock products in the SR than in the northern counties.

There was little change between 1949 and 1959 in the major enterprise sources of income in either region. However, the total value of farm products sold increased 37 percent (\$22,052 million to \$30,337 million) in the Southern Region during this period. The increase was only 11 percent (\$203 million to \$226 million) in the Northern Region. During the same period the total value of farm products sold increased 38 percent in the United States.

Table 61.--Percentage distribution of counties by county average value of farmland and buildings per acre, Northern and Southern Lake States Regions, 1950 and 1959

County average value of farmland and buildings per acre	1950		1959	
	Northern Region	Southern Region	Northern Region	Southern Region
	<u>Percent</u>			
Less than \$100 -----	100	86	50	20
\$100 to \$199 -----	--	14	46	40
\$200 and greater --	--	--	4	40
Total -----	100	100	100	100

Source: U.S. Census of Agriculture, 1950 and 1959 (73).

Table 62.--Percentage distribution of farm products sold, by commodity groups, and value of products sold, Northern and Southern Lake States Regions, and United States, 1949 and 1959

Products	1949			1959		
	Northern Region	Southern Region	United States	Northern Region	Southern Region	United States
All livestock and livestock products:	<u>Percent</u>					
Dairy products -----	45	32	14	46	33	13
Poultry and poultry products -----	7	10	8	6	7	7
Other livestock and livestock products--	22	33	33	23	32	36
Subtotal -----	74	75	55	75	72	56
All crops -----	23	25	44	22	28	43
Forest products -----	3	<u>1/</u>	1	3	<u>1/</u>	1
Total -----	100	100	100	100	100	100
Total value (mil. dol.):	203	1,996	22,052	226	2,570	30,337
Value per farm (dollars) -----	2,206	4,854	4,100	3,950	7,751	8,196

1/ Less than 0.5 percent.

Source: U.S. Censuses of Agriculture, 1950 and 1959 (73).

Farm Operator Level-of-Living

The index of farm operator level-of-living is an indicator of the well-being of farmers in the two regions. In 1950, 96 percent of the northern counties had a county average index of less than 70, compared with only 13 percent of the southern counties (table 63). By 1959, the average level-of-living index had increased substantially in both regions, but the differential between them continued. Seventy-seven percent of the northern counties had an average index between 90 and 109, but 71 percent of the southern counties had an index of 110 or more.

It seems likely that the agricultural industry in the Northern Region will continue to decline more rapidly than in the Southern Region and in the Nation. The NR lacks the resources of abundant good soil, and an adequate growing season to compete well in agriculture today. The solution of the problem of low-farm income in the northern counties lies in nonfarm work opportunities locally

Table 63.--Percentage distribution of counties by county average farm operator family level-of-living index, Northern and Southern Lake States Regions, 1950 and 1959

Level-of-living index	1950		1959	
	Northern Region	Southern Region	Northern Region	Southern Region
	<u>Percent</u>			
Less than 70 -----	96	13	1	--
70 to 89 -----	4	66	14	2
90 to 109 -----	--	21	77	27
110 or greater -----	--	--	8	71
Total -----	100	100	100	100
Number of counties -----	79	162	79	162

Source: County and City Data Book, 1962 (81).

and elsewhere. For those committed to agriculture, the latter alternative is usually unrealistic. Also, there are individual farms in the NR that will remain competitive with other areas. The agriculture is primarily based on livestock and this will likely continue to be the major type of agriculture in the NR.

FORESTRY AND FISHERIES 28/

The NR was once the Nation's leading lumber producer. The virgin forests and mining provided the initial resource base for the economic development of the region. Pines were logged first, from 1870 to about 1930 when the pine was essentially cut out. Hardwood logging began about 1910, and proceeded in a series of waves, each removing the largest, most desirable trees for the sawmills. By World War II, hardwood logging had largely ended. 29/

New forest growth, developed with fire protection and reforestation, has created a forested area of high potential and increasing productivity. "It needs to be pointed out, however, that a region with a depleted timber resource does not increase production automatically as soon as the resource begins to mend. Inventory surpluses must be built substantially before industrial

28/ The background data for this section was prepared by John L. Okay, Agricultural Economics Department, Michigan State University.

29/ Lee M. James (17). This document refers specifically to Michigan's Upper Peninsula. Nevertheless, much of the narrative, particularly on forestry, is equally relevant to the entire NR.

expansion can be attracted." ^{30/} It is also necessary to shift from large to smaller timber and to find uses for former weed species, like aspen, that have invaded logged-over and burned areas. The pulp and paper industry, adapted to using small timber and increasing quantities of the former weed species, has helped to cushion the economic impact of the decline in lumber and related industries in the NR.

Land in Forests

Forests are the dominant land use of the northern counties (table 64). About four-fifths (41.3 million acres) of the land area is in forests, with nearly three-fourths (39.1 million acres) in commercial forests. ^{31/} There are only slight differences among the States in the proportion of total land area in forests. Between 1945 and 1963 there was a slight decrease in total forested acreage and a small increase in commercial forest area.

Northern Michigan had 16.4 million acres of commercial forests in 1963, Minnesota 13.7 million acres, and Wisconsin 9 million acres. The 39 million acres of commercial forests within the boundaries of the NR is approximately 8 percent of the total commercial forest acreage in the Nation. The forest land located in the NR is nearly evenly distributed among the 79 counties of the region (fig. 26).

Total forest acreage in the Southern Region was only about one-fifth (13 million acres) of the land area in 1963. About one-half of this was in southern Michigan.

Much of the data on forestry are by forestry regions, delineated on natural characteristics. Thus, most of the information is in State statistics.

Forest Ownership

For the Lake States, 41 percent of the commercial forest land is in public ownership and 59 percent in private ownership (table 65) (¹⁷, ⁵⁰, ⁵²). Fifty-six percent of Minnesota's commercial forest acreage is publicly owned, compared with 33 percent for Michigan and Wisconsin. Also, in Minnesota, State and local governments own about 40 percent of the commercial forest land, compared with 20 percent in Michigan and Wisconsin.

Wood-using firms own 6 percent of the total commercial forest acreage in the Lake States, farmers 26 percent, and other private holders 27 percent.

^{30/} Lee M. James and Aubrey Wylie. Timber Products. Phase II, Project 80, Mich. State Univ., Mar. 1965 (unpublished report).

^{31/} See footnote to table 64 for definition of commercial forests.

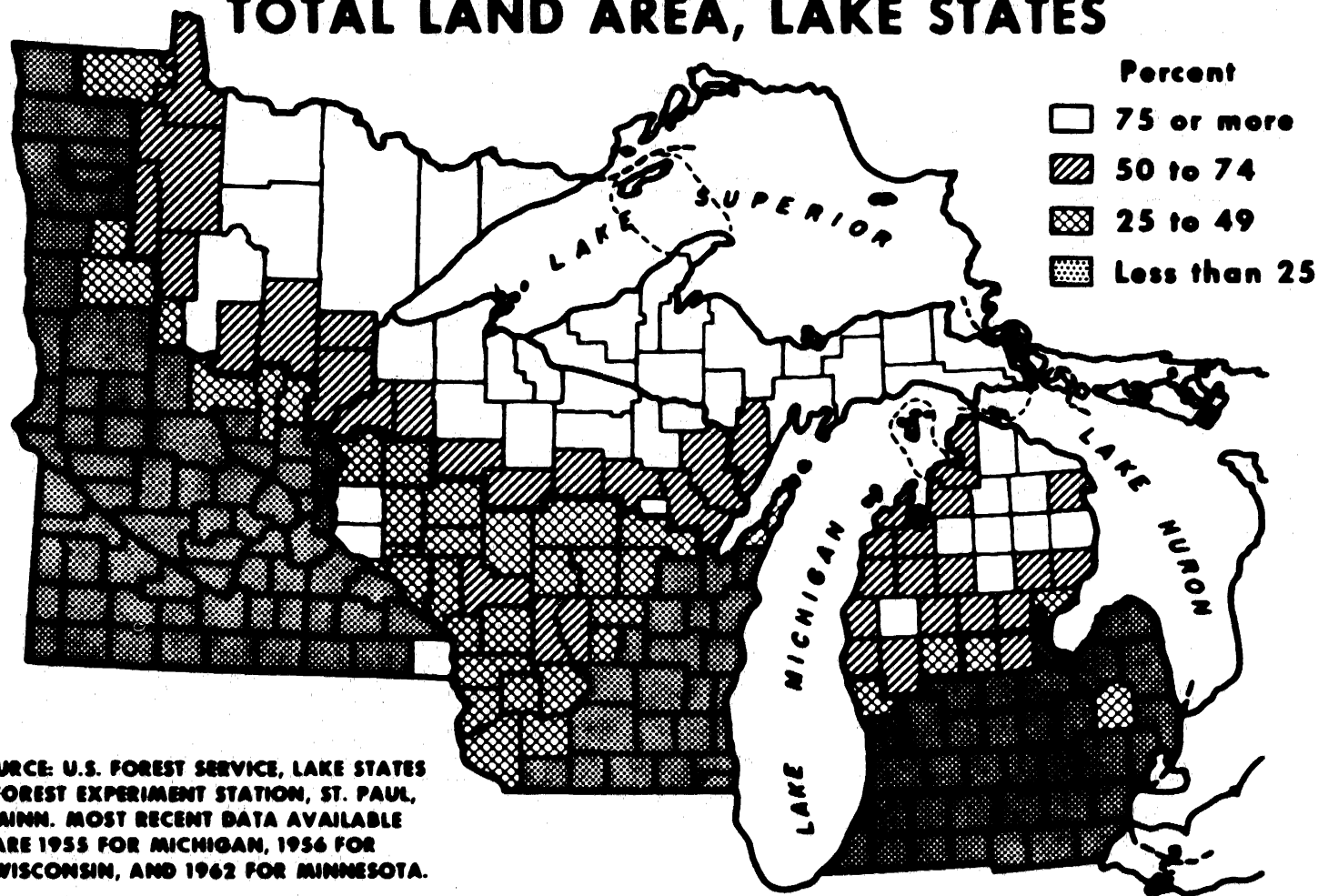
Table 64.--Forested land areas, acreage and percentage of total land area, Northern and Southern Lake States Regions, 1945 and 1963

Type of forested land, and year	Northern Region				Southern Region			
	Mich.:	Wis.:	Minn.:	Total	Mich.:	Wis.:	Minn.:	Total
	----- 1,000 acres -----							
Commercial forests								
1/:								
1945 -----	15,240	9,980	13,480	38,700	2,140	6,285	3,220	11,645
1963 -----	16,383	8,950	13,746	39,079	2,738	6,446	3,313	12,497
Other forests:								
1945 -----	1,470	300	1,750	3,520	150	435	1,250	1,835
1963 -----	487	91	1,628	2,206	93	101	360	554
Total forested land:								
1945 -----	16,710	10,280	15,230	42,220	2,290	6,720	4,470	13,480
1963 -----	16,870	9,041	15,374	41,285	2,831	6,547	3,673	13,051
	----- Percent -----							
Forested land as a percentage of total land area:								
Commercial forests:								
1945 -----	72	85	68	73	14	27	10	17
1963 -----	77	76	70	74	18	28	11	18
Total forested land:								
1945 -----	78	88	77	80	15	29	14	19
1963 -----	79	77	78	78	19	28	12	19

1/ Forest land that is producing, or is capable of producing, crops of industrial wood and not withdrawn from timber utilization. "Commercial forests" has no connotation with respect to ownership.

Source: Forest Service, USDA (71).

COMMERCIAL FOREST AREA AS PERCENTAGE OF TOTAL LAND AREA, LAKE STATES



SOURCE: U.S. FOREST SERVICE, LAKE STATES
FOREST EXPERIMENT STATION, ST. PAUL,
MINN. MOST RECENT DATA AVAILABLE
ARE 1955 FOR MICHIGAN, 1956 FOR
WISCONSIN, AND 1962 FOR MINNESOTA.

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Figure 26

Table 65.--Percentage distribution of commercial forest land, by ownership,
Lake States, 1963

State	Percentage of total commercial forest land							
	Public				Private			
	National	Other	State	Total	Forest	Farmers	Miscell-	Total
	forests	Federal	and local		industry	:private:	aneous	
Michigan -----	12	1	20	33	8	20	39	67
Minnesota -----	13	3	40	56	4	20	20	44
Wisconsin -----	9	4	20	33	6	41	20	67
Lake States								
total -----	12	2	27	41	6	26	27	59

Source: Forest Service, USDA (71).

Volume of Timber

Acreage does not indicate the volume nor value of timber. It was estimated that the Lake States had over 25 billion cubic feet of growing stock in 1953 and 32 billion cubic feet in 1963 (table 66). ^{32/} Hardwood species are 73 percent of this stand. However, the volume of softwood growing stock increased 27 percent between 1953 and 1963, somewhat above the increase of 22 percent for hardwoods.

Farmers and nonforest-industry private interests own 54 percent of the growing stock in the Lake States (table 67). In Michigan and Wisconsin these private owners control nearly two-thirds of the volume of growing stock. But in Minnesota 42 percent of the growing stock is owned by State and local governments. In the three Lake States the forest industry controls 8 percent of the growing stock.

Timber Growth Versus Cut

It was estimated that growth of timber in the Lake States in 1962 exceeded the cut by 60 percent (table 68). While 54 percent of the growth was on farms and nonforest industry private holdings, 60 percent of the cut came from private tracts. Still, growth in timber owned by this group exceeded the cut by 55 percent.

The private forest industry cut 74 percent of their growth in 1962. The State and local governments cut only 23 percent. The forest inventory of hardwoods and softwoods held by various groups is increasing in the Lake States.

^{32/} See footnote to table 66 for definition of growing stock.

Table 66.--Net volume of growing stock on commercial forest land,
Lake States, 1953 and 1963 ^{1/}

State	All species		Softwoods		Hardwoods	
	1953	1963	1953	1963	1953	1963
	<u>Million cubic feet</u>					
Michigan -----	9,912	12,520	2,278	3,233	7,634	9,287
Wisconsin -----	8,071	8,866	1,436	1,499	6,635	7,367
Minnesota -----	7,235	9,802	2,829	3,607	4,406	6,195
Lake States total -----	25,218	31,188	6,543	8,339	18,675	22,849

^{1/} Growing stock is defined as the net volume of live sawtimber and poletimber trees from stump to a minimum 4-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.

Source: Forest Service, USDA (70, 71).

Table 67.--Net volume and percentage of all species of growing stock,
by ownership, Lake States, 1963

State	National forests	Other public forests	Forest industry	Farmers and miscellaneous private	Total
	<u>Million cubic feet</u>				
Michigan -----	1,501	1,968	1,294	7,757	12,520
Wisconsin -----	783	1,838	595	5,650	8,866
Minnesota -----	1,713	4,107	578	3,404	9,802
Lake States total -----	3,997	7,913	2,467	16,811	31,188
	<u>Percent</u>				
Michigan -----	12	16	10	62	100
Wisconsin -----	9	21	7	63	100
Minnesota -----	17	42	6	35	100
Lake States total -----	13	25	8	54	100

Source: Forest Service, USDA (71).

Table 68.--Net annual growth and cut of growing stock on commercial forest land, by ownership, Lake States, 1962 1/

Item	Ownership									
	National		Other		Forest		Farmers and		Total	
	forests		public		industry		miscellaneous private			
	Growth:	Cut:	Growth:	Cut:	Growth:	Cut:	Growth:	Cut:	Growth:	Cut:
	----- Million cubic feet -----									
Soft woods ----	52.0	27.4	100.0	35.6	33.8	27.3	112.3	64.5	298.1	154.8
Hard woods ----	85.3	23.8	200.8	33.7	54.1	37.7	514.2	219.4	854.4	314.6
Total all species ----	137.3	51.2	300.8	69.3	87.9	65.0	626.5	283.9	1152.5	469.4
	----- Percent -----									
Growth, by ownership, as percentage of total growth (all species)-	12	--	26	--	8	--	54	--	100	--
Cut, by ownership, as percentage of total cut (all species) -----	--	11	--	15	--	14	--	60	--	100
Cut as percentage of growth, within ownership groups (all species)-	--	37	--	23	--	74	--	45	--	41

1/ These data include Michigan, Minnesota, Wisconsin, North Dakota, and eastern South Dakota. However, North and South Dakota comprise only 2.0 percent of the growth and 0.6 percent of the cut. Therefore, the data are essentially for the three Lake States.

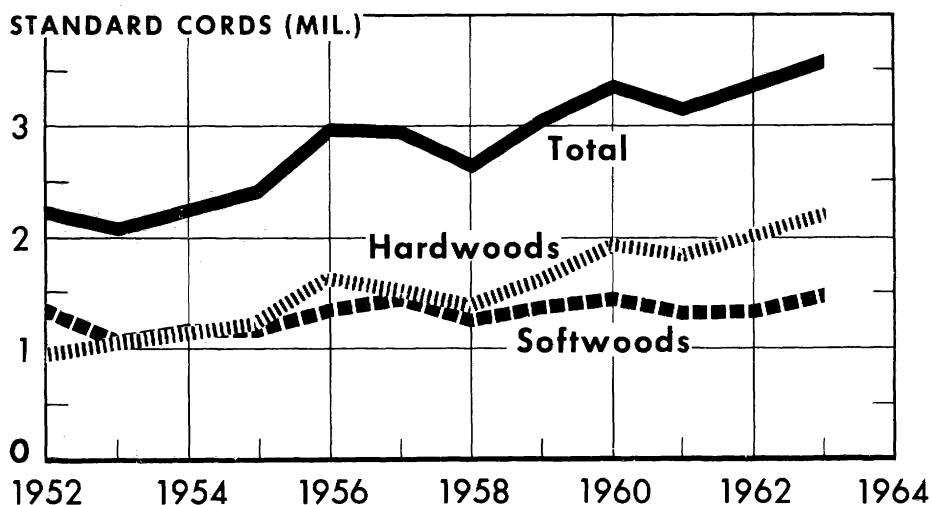
Source: Forest Service, USDA (71).

Pulpwood

Pulpwood has become one of the major forest industries in the Lake States (fig. 27). Pulpwood production increased 60 percent from 1952 to 1963. Softwoods were the major source of pulpwood stock prior to 1954, but changes in paper production have permitted the use of more hardwoods. By 1963 nearly twice as many hardwoods as softwoods were used by the pulp and paper industry in the Lake States.

The volume of pulpwood production, 1959-63, was nearly equal for Michigan, Wisconsin, and Minnesota (table 69). However, the destination of the cord

VOLUME OF PULPWOOD PRODUCTION, LAKE STATES



SOURCE: U.S. Forest service, Lake States Forest Experiment Station.

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ECONOMIC RESEARCH SERVICE

Figure 27

Table 69.--Pulpwood production by State of origin and destination,
Lake States, 1959-63 average

State of cut	Total cut	Destination			
		Michigan	Wisconsin	Minnesota	Other
<hr/>					
<u>Thousand standard cords</u>					
Michigan	1,183	660	519	---	4
Wisconsin	1,109	1	1,070	18	20
Minnesota	1,010	2	247	745	16

Source: Lake States Forest Experiment Station, Resource Bul. LS-1, December 1964.

pulpwood for processing was different among the three States (22). Less than half of the pulpwood harvested in Michigan in 1963 was processed in Michigan plants, with the rest shipped to Wisconsin. Almost all the Wisconsin harvest was processed in that State. About 80 percent of the Minnesota harvest was processed in Minnesota, with the balance going to Wisconsin. Thus, Wisconsin had the major pulp processing facilities of the region.

Sawtimber

In 1962, 757 million board feet of saw logs and 56 million board feet of veneer logs were harvested in the Lake States (table 70). The amount of sawtimber cut (1,291 million board feet) was half of the growth. Wisconsin had the highest ratio of cut to growth (74 percent). While production of sawtimber is low in the Lake States, the excess of growth over cut is promising for the future.

Table 70.—Net annual growth of sawtimber on commercial forest land and output of sawtimber products, all species, Lakes States, 1962

State	Sawtimber		Output of sawtimber products ^{1/}	
	Growth	Cut	Saw logs	Veneer logs
	----- Million board feet -----			
Michigan -----	1,036	495	319	22
Wisconsin -----	633	467	277	25
Minnesota -----	875	329	161	9
Lake States total--	2,544	1,291	757	56

^{1/} Excludes pulpwood output from sawtimber.

Source: Forest Service, USDA (71).

Lake States Timber Production Relative to U.S. Production

Timber products are classified as (1) sawlogs, (2) pulpwood, (3) veneer logs, and (4) all other products. ^{33/} Between 1952 and 1962 the Lake States gained a larger share of U.S. output only in all other products (table 71). They declined slightly in the relative harvest of sawlogs and reduced veneer log output to less than 1 percent of U.S. production. The Lake States as a whole supplied a smaller share of the total U.S. timber output in 1962 than in 1952.

Forest Industry Employment

Between 1950 and 1960, employment declined in the wood products industries, but increased in the paper and allied products industries. For the Lake States employment declined 36 percent between 1948 and 1962 in the lumber and wood products industries, a loss of nearly 19,000 jobs (table 72). Employment increased 20 percent, or 13,000 jobs, in the paper and allied products industries. But the two industries combined had a decline of 6,000 jobs.

Between 1948 and 1962 employment in paper and allied products industries increased, but between 1956 and 1962 there were 7,000 fewer jobs. Employment in the lumber and wood products industries also declined by 11,000 jobs between 1956 and 1962. It is estimated that of the 11,000 jobs, 6,000 were in the Northern and 5,000 in the Southern Region. This means a 33-percent decrease in lumber and woods products industries employment in the NR and a 19-percent decrease in the SR.

"As a portent of the future, the great decline which has occurred in large segments of the wood-using industries can be misleading. Such declines as have

^{33/} See appendix table 81 for the products included in the "all other products" group and for detailed output of timber products by types.

Table 71.--Total output of timber products in the Lake States as a percentage of total U.S. output, by type of product, 1952 and 1962

Products	Michigan		Wisconsin		Minnesota		Total	
	1952	1962	1952	1962	1952	1962	1952	1962
	Percent							
Sawlogs -----	1.2	0.9	1.0	0.8	0.3	0.5	2.5	2.2
Pulpwood -----	3.0	2.5	2.2	2.5	3.7	2.4	8.9	7.4
Veneer logs -----	1.5	0.4	1.1	0.4	0.3	0.1	2.9	0.9
All other products ^{1/-}	3.2	4.6	3.2	3.3	2.1	2.0	8.5	9.9

^{1/} See appendix table 81 for products included in this classification.

Source: Forest Service, USDA (70, 71).

Table 72.--Estimated employment in lumber and wood products industries and paper and allied products industries, Lake States, selected years

State and year	Lumber and wood products industries <u>1</u> /	Paper and allied products industries
	----- Employment (mid-March) -----	
Michigan:		
1948 -----	21,125	25,398
1953 -----	17,583	29,122
1956 -----	15,789	30,178
1962 -----	11,522	28,865
Percent change, 1948-62 -----	-45	14
Wisconsin:		
1948 -----	20,417	32,855
1953 -----	20,865	33,115
1956 -----	20,155	39,904
1962 -----	15,683	37,851
Percent change, 1948-62 -----	-23	15
Minnesota:		
1948 -----	10,636	9,166
1953 -----	9,130	16,624
1956 -----	8,457	17,461
1962 -----	6,207	13,900
Percent change, 1948-62 -----	-42	52
Total Lake States:		
1948 -----	52,178	67,419
1953 -----	47,578	78,861
1956 -----	44,401	87,543
1962 -----	33,412	80,616
Percent change, 1948-62 -----	-36	20

1/ Excludes furniture.

Source: U.S. Census of County Business Patterns (75).

occurred resulted from mining the old-growth stands of timber, but unlike minerals, timber is renewable. New stands of timber have been growing, and as the forests develop, new wood-using products can be built"(17).

Demand for Wood Products

The demand outlook for wood products from the Lake States must be guided by expectations of national demand, since the products are destined mainly for national markets. The long-term outlook for major timber products is good, particularly for pulpwood, which is of major importance in the NR (70).

Fisheries

Commercial fishing is carried out on the five Great Lakes and three International Lakes (Lake of the Woods, Namakan Lake, and Rainy Lake) by vessels from eight States and Canada. 34/

Since 1940, the annual catch of valuable lake trout and lake whitefish has dwindled to practically nothing. The annual catch of low-valued species (herring, chubs, smelt, perch) has increased enough to offset the loss in volume of trout and whitefish, but not the loss of value. Between 1950 and 1960, the number of commercial fishing vessels on the Great Lakes declined from 661 to 424, and the number of fishermen from 4,840 to 3,090.

Changes in the Great Lakes fishing industry "result from the invasion of carp, smelt, alewife, and sea lamprey, and selective fishing against the higher priced fish. The sea lamprey, a parasite, destroyed the lake trout of Lakes Huron, Michigan, and Superior, and inflicted damage on other species as whitefish, suckers, walleyes, and the larger chubs" (17, 88).

From 1952 to 1959 both the total quantity of fish and its value, in terms of 1957-59 purchasing power, declined steadily. The 1961 catch increased substantially, but the value of the catch remained about the same, reflecting the low-valued species. In 1962 both the quantity and value of catch decreased. In terms of 1957-59 dollars, the value of the Lake States catch in 1962 was about \$4 million, compared with \$7.3 million in 1952; this was a decline of about 45 percent in value but only 16 percent in quantity. Ports in the three Lake States account for nearly three-fourths of the total U.S. catch from the Great Lakes (table 73).

The Great Lakes fishing industry faces other serious problems. Methods of catching, handling, and marketing have changed little over the past 50 years. The industry has been slow to accept modern procedures of processing, packaging, and distribution. The Canadian Great Lakes fishing industry uses machines to head, dress, and fillet smelt and other species. Dressed and filleted fish, attractively packaged, frozen, breaded, and precooked, are featured in many U.S. stores.

The population of sea lamprey in Lake Superior was reduced an estimated 80 percent through selective chemical toxins by 1962. Fingerling lake trout were introduced. Recently, an increase in lake trout has occurred. The industry has probably passed the crisis of the lamprey invasion. Chemical control is being extended to the other Great Lakes, but 7 to 11 additional years must elapse before a breeding population of trout can develop after lamprey control.

In addition, the industry faces processing and marketing problems. The industry needs to update processing. The Great Lakes industry has not utilized the processing methods of the marine fisheries. Development of a filleting machine for yellow perch is a step, but more needs to be done. Without efficient processing facilities, most fish are sold fresh. In this form they are

34/ The International Lakes border much of northern Minnesota and Canada.

Table 73.--Great Lakes commercial fisheries catch, quantity and value, Lake States and United States, 1940 and 1950-62

Year	Lake States								Total U.S. catch	
	Michigan		Wisconsin		Minnesota		Total		from Great Lakes	
	Quantity:	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 lb.	\$1,000	1,000 lb.	\$1,000	1,000 lb.	\$1,000	1,000 lb.	\$1,000	1,000 lb.	\$1,000
1940	26,230	2,022	17,118	883	10,220	312	53,568	3,217	79,296	5,623
1950	23,153	3,497	18,399	2,198	4,686	379	46,238	6,074	70,882	10,846
1951	25,021	3,409	19,731	2,180	4,019	420	48,771	6,009	70,146	10,664
1952	29,232	4,162	21,614	2,249	5,089	455	55,935	6,866	81,813	11,477
1953	25,013	3,315	20,528	1,936	4,627	383	50,168	5,634	77,252	9,578
1954	27,231	3,203	20,855	2,169	4,535	484	52,621	5,856	81,190	9,980
1955	25,430	2,945	20,195	2,306	4,071	306	49,696	5,557	76,754	9,699
1956	24,636	2,975	20,444	2,458	4,423	308	49,503	5,741	80,645	10,164
1957	22,478	2,536	18,480	2,353	4,752	327	45,710	5,216	75,530	9,576
1958	25,488	2,944	18,251	2,283	6,063	265	49,802	5,492	71,690	8,651
1959	22,323	2,681	16,833	2,078	5,326	359	44,482	5,118	65,817	7,104
1960	25,021	2,998	18,394	1,934	4,872	297	48,287	5,229	68,243	7,133
1961	24,535	2,930	21,925	1,988	5,835	309	52,295	5,227	70,641	6,971
1962	22,121	2,479	19,075	1,341	6,025	277	47,221	4,097	65,572	5,533

Source: U.S. Department of the Interior (86).

extremely perishable and must be marketed without delay. Seasonal gluts depress prices, often to the point where fishing is stopped. Thus, processing and storage facilities are needed for a more uniform flow of fish to the market.

The present structure of the industry in the Great Lakes area precludes efficiency in processing and storage similar to that in the coastal fisheries. Independent fishermen, using small boats, work with limited capital and fish in waters belonging to the State, along several thousand miles of shoreline. There is no port at which enough fish are landed to support processing and storage facilities like those of the Atlantic Coast. However, it seems feasible to establish several processing and storage facilities to which fish could be readily transported. At these locations, with good market information, the decision could be made to ship the fresh fish, freeze and store them, or process and store them. If these facilities were owned and operated by a fishermen's association, profits could accrue to the fishermen. But even if such an association were to be formed by other interests such as dealers, a more orderly flow of fish to the market should benefit the fishermen. A single marketing agency for the entire Lake States fishing industry could lead to further efficiency in distributing the product and utilizing the fishery resources. 35/

ECONOMIC DEVELOPMENT OPPORTUNITIES AND NEEDS

Education and Health

The population of the Northern Region is not as seriously handicapped by substandard educational levels or attitudes of indifference as in some depressed regions. The Ebasco report (12) indicates that the labor force of Michigan's Upper Peninsula has comparatively high productivity, with steady dependable workers, adaptable to instruction. Despite high outmigration, the region has capable and determined leadership. 36/ Efforts to upgrade labor qualifications need not be sacrificed simply because the cost and benefits of such efforts cannot be immediately balanced on a regional basis. Policy programs designed to accomplish this most certainly have both short- and long-run benefits for the region and the Nation as a whole.

Locations of institutions of higher learning can be partially independent of the wealth of the natural resource base. Establishment of universities and training schools can provide substantial and stable economic benefits for the communities in which these institutions are located. With the inevitable growth in numbers of students seeking higher education, a policy favoring expansion of existing colleges and vocational institutions and of creating new institutions in the Northern Region would benefit a number of communities.

35/ E. W. Roelofs, "Commercial Fisheries," Phase III, Project 80, Michigan State University, March 1965, unpublished.

36/ The examples are numerous, but one in particular that has a Northern Region orientation is the Northern Great Lakes Resource Development Committee, an active citizens' committee dedicated to development of the region.

Industry

The manufacturing industry is an important contributor to the economic well-being of the Northern Region. The growth of this industry has been relatively slow. The isolation of the Northern Region from markets and the lack of supporting facilities may continue to limit expansion of this industry, but the St. Lawrence Seaway offers low-cost transportation to world markets. This may offer a competitive advantage to Northern Region industries in world trade.

Mining

Two recent developments give new hope to the iron ore industry of the region: (1) Improved beneficiation processes that concentrate taconite into a high-grade iron ore, and (2) changes in tax structures that favor long-range capital investment in iron ore mining. ^{37/} The new processes will help to maintain the competitive position of the Superior ranges. However, the Midwestern steel industry need no longer rely solely on the iron ore deposits of the Superior ranges. High-grade iron ore is available from Canada, Venezuela, and Brazil via the St. Lawrence Seaway. Even if the mining industry maintains production, employment will likely decline because of the rapid adoption of laborsaving machinery.

Copper is the second most important mineral in the Northern Region. Production should continue for many years in view of recent discoveries of copper ore deposits in Northern Michigan, though copper is unlikely to be a major base for economic expansion of the region.

Employment in other minerals industries accounts for a small share of the total employment in the Northern Region. However, it is vital to certain communities. Employment and output in petroleum and natural gas industries are expected to decline. Output of some of the nonmetallic minerals is likely to increase. Limestone, gypsum, and dolomite output are expected to increase as the general economy grows, but these industries employ few people.

Forestry

One of the major exporters of the region is the forestry and wood products industry. According to Lee M. James, the outlook of the forest industry is excellent (17).

Forestry resources are renewable, but the same species do not always grow as in the virgin forests, but new technology in processing wood products permits use of wood formerly of little value. The forestry and wood products industries can contribute increasingly to the economic development of the Northern Region. Concerted efforts to improve management practices on publicly owned forests and privately owned farm woodlots would upgrade the value of this

^{37/} Beneficiation involves crushing, washing, and purification of low-grade iron ore, enabling shipment of high-grade iron ore content (from 60 to 70 percent) to the mills in the form of small pellets.

resource. Forestry marketing practices also appear to need improvement. A high priority should be given to establishing forest management and marketing associations.

Agriculture

Farm employment and acreage in agricultural use will almost certainly continue to decline, implying continued off-farm migration. Attractive alternative opportunities must be offered to those people who wish to leave agriculture (96).

The agricultural industry in the region will be concentrated in the more favorable locations, and on larger and more efficient units. There will be a wide range in the economic success of farmers in the region. Efforts should continue to increase the efficiency of resource use by farmers. But with the relatively low comparative advantage of agriculture in the Northern Region, there is little reason to expect expansion.

The St. Lawrence Seaway

Water transportation is an important link between the economy of the Northern Region and the industrial cities of the Midwest, and with world trade centers. Improvement of the St. Lawrence Seaway has stimulated the import of iron ore from Canada and other foreign countries. This has encouraged the development of new technology, and the restructuring of tax incentives for the mining industry. Policies which are designed to deepen the St. Lawrence channels further and extend the shipping season will have mixed impacts on the NR economy. They may increase competition from foreign-based iron ore deposits because of lower cost shipping through the Seaway to the Great Lakes steel industries. But these policies may substantially reduce the cost of shipping from NR ports to world markets. Policies to improve NR docking and shipping point facilities would contribute to increased trade.

Recreation

Recreation will have an increasingly important role in the economic growth of the Northern Region. The combination of growing population, increasing per capita income, a shorter work week, and the natural resources of the NR provide a favorable environment for growth in the outdoor recreation industry. It has been estimated that this industry will expand two to three times as fast as the national economy (58).

Outdoor recreation in the NR has been a seasonal industry, providing only summer employment. But this pattern is changing. Rapid growth in boating and water sports and in the use of house trailers for camping has stimulated summer tourist business. After the summer tourist season come the partridge and duck hunting season, the bow-and-arrow deer hunting season, and then the regular deer season. With winter snow accumulation, the ski industry, which is rapidly expanding, reaches its peak in January and February. Cold weather also brings ice fishing, and with spring, the stream and lake fishermen come to the Northland. With this array of all-season attractions, the tourist industry has become a year-round business.

Protection of the natural beauty of the region is imperative if the tourist industry is to grow. This will likely call for a step-up in group actions such as zoning, establishment of parks and recreation areas, development of fishing and swimming sites, access roads, and further development of supporting public facilities and services. Several areas in the NR are being designated as national parks and national recreation areas. These will add significantly to the tourist attraction of the region.

Other Needs

Because increased resource mobility contributes to economic growth, there is need to identify bottlenecks that prevent physical and human resources from being used at their best and to devise alternative means to improve mobility.

There are certainly situations where job opportunities exist while qualified workers are unavailable. People with skills required to fill these jobs may be unemployed or underemployed in other areas; neither employer nor employee may be aware of this situation. There is need to identify the extent of these problems and to supply information to overcome them. Furthermore, there are undoubtedly situations where jobs exist and there are no qualified people anywhere to meet the demand; training programs can be initiated to improve these situations. Implicit in this is the need to determine the factors that retard or stimulate occupational mobility.

Information is needed on comparative advantage potentials as they influence industry location and expansion possibilities. Input-output analysis of economic sectors can provide valuable insights into these questions. It can also estimate the multiplier effects of various types of investments.

Public investments are an important component of economic growth. Information on their benefits and costs would aid the decisionmaking process for effectively allocating public investments among the many alternatives.

There is need to determine the locations or centers and the types of investments that are most likely to make the maximum contribution to rapid economic growth. The recreation industry must be developed in viable complexes of recreation and related services.

All economic activity takes place within an institutional framework which may either encourage or restrict economic growth. Technical, engineering, and other physical science activities can discover new and improved ways of utilizing resources. Implementation of these discoveries depends on a community's environment as determined by State and local governments and by formal and informal leadership groups.

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APPENDIX

Table 74.--Net migration of civilian and military population, by age, Northern and Southern Lake States Regions, 1950 to 1960

Age group, years	Net migration		Net migration rate <u>1/</u>	
	Northern	Southern	Northern	Southern
	Region	Region	Region	Region
	<u>Number</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>
0 to 9 -----	-3,723	70,892	-1	2
10 to 14 -----	-11,588	19,822	-8	2
15 to 19 -----	-22,245	1,548	-19	<u>2/</u>
20 to 24 -----	-46,410	-8,955	-61	-1
25 to 29 -----	-31,195	54,255	-42	7
30 to 34 -----	-5,028	43,684	-6	5
35 to 39 -----	-5,219	13,297	-6	1
40 to 44 -----	-4,012	7,852	-4	1
45 to 49 -----	-3,557	14,058	-4	2
50 to 54 -----	-2,459	7,358	-3	1
55 to 59 -----	-2,569	-4,652	-4	-1
60 to 64 -----	-695	-8,650	-1	-2
65 and older--	-8,535	-57,100	-5	-5
All ages --	-147,235	153,409	-10	1

1/ Number of persons as a percentage of 1960 population.

2/ Less than 0.5 percent.

Source: U.S. Department of Agriculture (68).

Table 75.--Percentage distribution of employed persons in the civilian labor force, by industry, Northern and Southern Lake States Regions and United States, 1950 and 1960

Industry and year	Northern Region				Southern Region				United States
	Michigan	Wisconsin	Minnesota	Total	Michigan	Wisconsin	Minnesota	Total	
1950:					<u>Percent</u>				
Agriculture -----	19	28	20	21	5	18	23	13	12
Forestry and fisheries--	1	1	<u>1/</u>	1	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
Mining -----	6	1	9	7	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	2
Construction -----	6	5	5	5	5	5	6	5	6
Manufacturing -----	21	19	15	18	43	32	17	34	26
Transportation and utilities -----	7	9	11	9	6	6	8	7	8
Wholesale and retail trade -----	17	16	17	17	18	17	20	18	19
Finance, insurance, and real estate -----	1	1	2	2	3	3	4	3	3
Services -----	16	15	16	16	16	15	18	16	18
Public administration --	4	3	4	3	3	3	3	3	4
Industry not reported --	2	2	1	1	1	1	1	1	2
Total -----	100	100	100	100	100	100	100	100	100
1960:									
Agriculture -----	8	18	10	11	3	11	15	8	7
Forestry and fisheries--	<u>1/</u>	1	1	1	<u>1/</u>	1	<u>1/</u>	<u>1/</u>	<u>1/</u>
Mining -----	6	1	9	6	<u>1/</u>	1	<u>1/</u>	<u>1/</u>	1
Construction -----	7	5	5	6	4	5	6	5	6
Manufacturing -----	23	23	16	20	40	30	20	33	27
Transportation and utilities -----	7	8	9	8	6	5	7	6	7
Wholesale and retail trade -----	20	18	18	19	18	18	20	18	18
Finance, insurance, and real estate -----	2	2	3	2	3	3	4	4	4
Services -----	21	17	22	20	20	19	21	19	21
Public administration --	4	4	5	4	3	4	4	4	5
Industry not reported --	2	3	2	3	3	3	3	3	4
Total -----	100	100	100	100	100	100	100	100	100

1/ Less than 0.5 percent.

Source: U.S. Census of Population, 1950 and 1960 (79).

Table 76.--Percentage distribution of employed persons in the civilian labor force, by occupation,
Northern and Southern Lake States Regions and United States, 1950 and 1960

Occupation and year	Northern Region				Southern Region				United States
	Michigan	Wisconsin	Minnesota	Total	Michigan	Wisconsin	Minnesota	Total	
1950:	Percent								
Professional and technical -----	7	6	8	7	9	8	9	9	9
Farmers and farm managers -----	14	19	13	15	4	11	16	8	8
Office managers and proprietors ---	9	9	9	9	8	8	9	8	9
Clerical -----	8	7	9	8	13	11	12	12	12
Sales -----	6	5	6	6	7	7	7	7	7
Craftsmen and foremen -----	13	11	14	13	16	14	12	15	14
Operatives -----	20	16	17	18	26	20	13	22	20
Private household -----	2	1	1	1	2	1	2	2	2
Service workers (excluding private household) -----	7	7	8	7	8	7	7	7	8
Farm laborers and foremen -----	5	10	6	7	1	7	8	4	4
Laborers (excluding farm and mine)---	8	8	8	8	5	5	4	5	6
Occupation not reported -----	1	1	1	1	1	1	1	1	1
Total -----	100	100	100	100	100	100	100	100	100
1960:									
Professional and technical -----	10	8	10	10	12	10	11	11	11
Farmers and farm managers -----	6	13	8	8	2	7	11	5	4
Office managers and proprietors ---	9	9	10	9	7	7	8	8	8
Clerical -----	10	9	11	10	14	13	14	14	15
Sales -----	6	6	6	6	8	7	8	7	7
Craftsmen and foremen -----	15	11	15	14	15	14	12	14	14
Operatives -----	21	18	16	19	22	21	14	20	18
Private household -----	2	2	3	2	2	2	2	2	3
Service workers (excluding private household) -----	10	9	10	9	9	8	9	9	8
Farm laborers and foremen -----	2	5	2	3	1	3	3	2	2
Laborers (excluding farm and mine)---	6	6	6	6	4	4	4	4	5
Occupation not reported -----	3	4	3	4	4	4	4	4	5
Total -----	100	100	100	100	100	100	100	100	100

Source: U.S. Census of Population, 1950 and 1960 (79).

Table 77.--Percentage distribution of unemployed persons in the civilian labor force, by occupation, Northern and Southern Lake States Regions and United States, 1950 and 1960

Occupation and year	Northern Region				Southern Region				United States
	Michigan	Wisconsin	Minnesota	Total	Michigan	Wisconsin	Minnesota	Total	
1950:	Percent								
Professional and technical -----	1	2	2	2	2	3	3	2	3
Farmers and farm managers -----	1	2	1	1	1/	1	1	1	1
Office managers and proprietors ---	2	2	2	2	2	2	2	2	2
Clerical -----	2	2	4	3	6	6	6	6	6
Sales -----	2	2	3	3	4	4	5	4	4
Craftsmen and foremen -----	15	14	16	15	14	14	15	14	14
Operatives -----	20	16	21	19	31	18	14	26	20
Private household -----	2	3	2	2	2	2	2	2	3
Service workers (excluding private household) -----	5	6	7	6	8	6	8	7	8
Farm laborers and foremen -----	3	4	4	3	1	3	6	2	4
Laborers (excluding farm and mine)-	23	23	24	23	9	12	15	11	12
Occupation not reported -----	24	24	14	21	21	29	23	23	23
Total -----	100	100	100	100	100	100	100	100	100
1960:									
Professional and technical -----	2	2	3	2	2	2	3	2	3
Farmers and farm managers -----	1	1	1/	1	1/	1	2	1	1
Office managers and proprietors ---	2	3	2	2	2	2	2	2	2
Clerical -----	4	5	6	5	9	8	8	8	9
Sales -----	3	3	3	3	5	5	5	5	5
Craftsmen and foremen -----	20	16	19	19	15	16	18	16	15
Operatives -----	28	30	25	27	35	33	25	33	28
Private household -----	2	3	3	3	3	2	2	2	3
Service workers (excluding private household) -----	10	7	8	8	9	8	9	9	10
Farm laborers and foremen -----	3	3	2	3	1	3	4	2	3
Laborers (excluding farm and mine)-	20	21	24	22	11	13	14	12	13
Occupation not reported -----	5	6	5	5	8	7	8	8	8
Total -----	100	100	100	100	100	100	100	100	100

1/ Less than 0.5 percent.

Source: U.S. Census of Population, 1950 and 1960 (79).

Table 78.--Percentage distribution of employed persons in the civilian labor force, by manufacturing industry, Northern and Southern Lake States Regions and United States, 1950 and 1960

Manufacturing industries	Northern Region		Southern Region		United States	
	1950	1960	1950	1960	1950	1960
	<u>Percent</u>					
Durables:						
Furniture, lumber and wood products -----	30	21	4	3	8	6
Primary metal -----	7	6	6	6	8	7
Fabricated metal -----	2	4	7	8	6	7
Machinery (excluding electrical) -----	6	8	14	15	9	9
Electrical machinery, equipment, and supplies:	1	2	3	6	5	8
Motor vehicles and motor vehicle equipment -----	4	2	34	25	6	5
Transportation equipment (excluding motor vehicles) -----	1	4	1	2	3	6
Other durable goods -----	6	7	5	6	8	8
Nondurables:						
Food and kindred products -----	10	13	9	10	10	10
Textile mill products --	1	<u>1/</u>	1	2	8	5
Apparel and other fabricated textile products--	4	4	1	1	7	7
Printing, publishing, and allied products ---	5	6	4	6	6	7
Chemicals and allied products -----	4	4	3	3	5	5
Other nondurable goods (including nonspecified manufacturing) -----	19	19	8	7	11	10
Total -----	100	100	100	100	100	100

1/ Less than 0.5 percent.

Source: U.S. Census of Population, 1950 and 1960 (79).

Table 79.--Production of principal minerals by value and rank, 1963, and 1963 value of production as a percentage change from the 1954-63 average, Northern Lake States Region

Northern region, State and county	1963				1963 value of production as a percentage change from the 1954-63 average
	Value of production	Rank by value of production			
	\$1,000	First	Second	Third	Percent
Michigan:					
1 Alcona -----:	159	Sand and gravel	Stone	1/	66
2 Alger -----:	54	Sand and gravel	1/	1/	-44
3 Alpena -----:	2/	Cement	Stone	Clays	2/
4 Antrim -----:	205	Clays	Sand and gravel	1/	65
5 Arenac -----:	1,315	Petroleum	Stone	Sand and gravel	-51
6 Baraga -----:	242	Sand and gravel	Stone	1/	-52
7 Benzie -----:	140	Sand and gravel	1/	1/	503
8 Charlevoix -----:	23	Sand and gravel	1/	1/	-44
9 Cheboygan -----:	246	Sand and gravel	Stone	1/	79
10 Chippewa -----:	4,237	Stone	Lime	Sand and gravel	2
11 Clare -----:	1,580	Petroleum	Sand and gravel	Natural gas	-26
12 Crawford -----:	418	Petroleum	Sand and gravel	Natural gas	-32
13 Delta -----:	196	Sand and gravel	Stone	1/	-48
14 Dickinson -----:	12,253	Iron ore	Sand and gravel	Stone	278
15 Emmet -----:	9,810	Cement	Stone	Sand and gravel	8
16 Gladwin -----:	1,248	Petroleum	Sand and gravel	1/	-8
17 Gogebic -----:	6,696	Iron ore	Sand and gravel	1/	57
18 Grand Traverse -----:	84	Sand and gravel	1/	1/	18
19 Houghton -----:	2/	Copper	Sand and gravel	Stone	2/
20 Iosco -----:	4,349	Gypsum	Sand and gravel	1/	3
21 Iron -----:	24,452	Iron ore	Manganiferous ore	Sand and gravel	3
22 Kalkaska -----:	68	Petroleum	Sand and gravel	Natural gas	-62
23 Keweenaw -----:	2/	Copper	Sand and gravel	1/	2/
24 Lake -----:	56	Sand and gravel	Petroleum	1/	-31
25 Leelanau -----:	101	Sand and gravel	1/	1/	54
26 Luce -----:	50	Sand and gravel	1/	1/	-18
27 Mackinac -----:	2/	Stone	Sand and gravel	1/	2/
28 Manistee -----:	16,508	Salines	Salt	Sand and gravel	43
29 Marquette -----:	2/	Iron ore	1/	1/	2/
30 Mason -----:	2/	Salines	Lime	Petroleum	2/
31 Mecosta -----:	191	Sand and gravel	Petroleum	Stone	-44
32 Menominee -----:	674	Lime	Sand and gravel	1/	-26
33 Missaukee -----:	1,467	Petroleum	Sand and gravel	Natural gas	-18
34 Montmorency -----:	98	Sand and gravel	Petroleum	1/	99
35 Nawaygo -----:	228	Sand and gravel	Petroleum	Stone	-54
36 Oceana -----:	1,236	Petroleum	Sand and gravel	Natural gas	-7
37 Ogemaw -----:	1,092	Petroleum	Sand and gravel	Natural gas	-43
38 Ontonagon -----:	2/	Copper	Silver	Sand and gravel	2/
39 Osceola -----:	986	Petroleum	Sand and gravel	Stone	-48

-- Continued

Table 79.--Production of principal minerals by value and rank, 1963, and 1963 value of production as a percentage change from the 1954-63 average, Northern Lake States Region -- continued

Northern region, State and county	1963				1963 value of production as a percentage change from the 1954-63 average
	Value of	Rank by value of production			
	production				
	\$1,000	First	Second	Third	Percent
40 Oscoua -----	53	Sand and gravel	Petroleum	1/	113
41 Otsego -----	30	Sand and gravel	Natural gas	1/	-80
42 Presque Isle -----	2/	Stone	Sand and gravel	1/	2/
43 Roscommon -----	668	Petroleum	Sand and gravel	Natural gas	-47
44 Schoolcraft -----	96	Sand and gravel	1/	1/	-92
45 Wexford -----	59	Sand and gravel	1/	1/	-13
Total -----	91,368	--	--	--	49
Wisconsin:					
1 Ashland -----	2/	Stone	Sand and gravel	1/	2/
2 Bayfield -----	2/	Sand and gravel	Stone	1/	2/
3 Burnett -----	71	Sand and gravel	1/	1/	-25
4 Douglas -----	2/	Lime	Sand and gravel	1/	2/
5 Florence -----	34	Sand and gravel	1/	1/	186
6 Forest -----	52	Sand and gravel	1/	1/	-25
7 Iron -----	2/	Iron ore	Sand and gravel	1/	2/
8 Langlade -----	245	Sand and gravel	1/	1/	21
9 Lincoln -----	2/	Sand and gravel	Peat	1/	2/
10 Marinette -----	2/	Stone	Sand and gravel	1/	2/
11 Oconto -----	212	Sand and gravel	Stone	1/	-1
12 Oneida -----	220	Sand and gravel	1/	1/	24
13 Price -----	60	Sand and gravel	1/	1/	362
14 Rusk -----	83	Sand and gravel	1/	1/	10
15 Sawyer -----	64	Sand and gravel	1/	1/	-7
16 Taylor -----	390	Sand and gravel	1/	1/	18
17 Vilas -----	137	Sand and gravel	1/	1/	97
18 Washburn -----	2/	Sand and gravel	1/	1/	2/
Total -----	1,568	--	--	--	122
Minnesota:					
1 Aitkin -----	67	Sand and gravel	Peat	1/	-29
2 Beltrami -----	2/	Sand and gravel	Peat	1/	2/
3 Carlton -----	419	Peat	Sand and gravel	Clays	64
4 Cass -----	136	Sand and gravel	Stone	1/	69
5 Clearwater -----	8	Sand and gravel	1/	1/	-51
6 Cook -----	18	Sand and gravel	1/	1/	-62
7 Crow Wing -----	5,670	Iron ore	Manganiferous ore	Sand and gravel	-57
8 Hubbard -----	53	Sand and gravel	1/	1/	-10

-- Continued

Table 79.--Production of principal minerals by value and rank, 1963, and 1963 value of production as a percentage change from the 1954-63 average, Northern Lake States Region -- continued

Northern region, State and county	1963				1963 value of production as a percentage change from the 1954-63 average
	Value of production	Rank by value of production			
	<u>\$1,000</u>	<u>First</u>	<u>Second</u>	<u>Third</u>	<u>Percent</u>
9 Itasca -----	72,799	Iron ore	Sand and gravel	Peat	-20
10 Koochiching -----	157	Sand and gravel	<u>1/</u>	<u>1/</u>	177
11 Lake -----	231	Sand and gravel	<u>1/</u>	<u>1/</u>	325
12 Lake of the Woods --	186	Sand and gravel	<u>1/</u>	<u>1/</u>	225
13 Pine -----	178	Sand and gravel	Peat	<u>1/</u>	207
14 Roseau -----	143	Sand and gravel	<u>1/</u>	<u>1/</u>	29
15 St. Louis -----	337,243	Iron ore	Cement	Sand and gravel	7
16 Wadena -----	95	Sand and gravel	Stone	<u>1/</u>	29
Total -----	417,403	--	--	--	99
Total Northern Region ---	510,339	--	--	--	84

1/ Rank not applicable due to scarcity of mineral types produced in county.

2/ Data not available for value of production.

Source: U.S. Department of Interior (87).

Table 80.--Number of farms, by economic class, Northern and Southern Lake States Regions, 1949 and 1959

Value of farm product sold (dollars)	Northern Region				Southern Region			
	Michigan	Wisconsin	Minnesota	Total	Michigan	Wisconsin	Minnesota	Total
	<u>Number</u>							
Commercial farms, 1949:								
250 to 2,499 -----	14,253	9,290	10,553	34,096	31,212	27,308	25,490	84,010
2,500 to 4,999 -----	7,027	6,889	5,453	19,369	26,038	45,108	39,816	110,962
5,000 to 9,999 -----	2,550	2,464	1,667	6,681	18,624	41,944	50,928	111,496
10,000 and greater ----	924	452	462	1,838	6,196	12,300	22,652	41,148
Other farms -----	13,335	6,502	10,300	30,137	35,430	16,304	11,780	63,514
Total farms -----	38,089	25,597	28,435	92,121	117,500	142,964	150,666	411,130
Commercial farms, 1959:								
50 to 2,499 -----	2,051	1,211	2,286	5,548	4,306	4,657	6,990	15,953
2,500 to 4,999 -----	4,781	4,609	3,817	13,207	16,876	23,715	24,416	65,007
5,000 to 9,999 -----	3,166	4,313	2,485	9,964	16,187	39,210	42,045	97,442
10,000 and greater ----	2,060	1,190	873	4,123	15,615	27,791	37,404	80,810
Other farms -----	11,569	4,664	8,024	24,257	35,154	19,842	17,387	72,383
Total farms -----	23,627	15,987	17,485	57,099	88,138	115,215	128,242	331,595

Source: U.S. Censuses of Agriculture, 1950 and 1959 (74).

Table 81.--Total output of timber products, by type of product, Lake States, 1952 and 1962 ^{1/}

Area	Type of product									All other products ^{2/} (cubic feet)		
	Sawlogs (board feet)			Pulpwood (standard cords)			Veneer logs (board feet)					
	Softwood	Hardwood	Total	Softwood	Hardwood	Total	Softwood	Hardwood	Total	Softwood	Hardwood	Total
----- Million -----												
1952:												
Michigan ----	108.6	374.0	482.7	0.4	0.2	0.7	0.2	36.0	36.2	27.2	117.6	144.8
Wisconsin ---	83.0	249.2	332.1	.2	.2	.6	.2	26.8	27.0	17.7	127.6	145.3
Minnesota ---	98.8	92.5	191.2	.6	.2	.9	--	7.2	7.2	28.0	67.8	95.8
Total (Lake States) --	290.4	715.7	1,006.0	1.2	.6	2.2	.4	70.0	70.4	72.9	313.0	385.9
U.S. total--	31,507.0	8,003.1	39,510.2	21.4	3.6	25.0	1,548.2	919.1	2,467.3	188.6	2,328.8	4,517.6
1962:												
Michigan ----	73.0	246.0	319.0	.4	.6	1.0	.2	22.0	21.8	4.4	19.0	23.6
Wisconsin ---	67.0	210.0	277.0	.3	.7	1.0	--	25.0	24.9	2.8	14.0	16.8
Minnesota ---	85.0	76.0	161.0	.6	.4	1.0	--	9.2	9.2	4.1	5.6	9.8
Total (Lake States) --	225.0	532.0	757.0	1.3	1.7	3.0	.2	56.2	55.9	11.3	38.6	50.2
U.S. total--	27,334.8	6,797.6	34,132.4	33.2	10.0	43.2	4,931.6	985.6	5,917.2	253.8	255.2	509.0

^{1/} Total output includes that from both roundwood and plant residues.^{2/} All other products includes: Cooperage stock, poles, piling, posts, hewn ties, mine timbers, box and shingle bolts, excelsior bolts, fuelwood, and other miscellaneous wood products.

Source: Forest Service, U.S. Department of Agriculture (70, 71).